RAILROAD GAZETTE

FRIDAY, MAY 6, 1904.

CONTENTS

ILLUSTRATED:
Track Elevation of Pennsylvania in Newark, N. J. 338
The "Climax" Vestibule Diaphragm..... 344
A Large Plate Girder Bridge on the Erie..... 345
An Adjustable Scaffold for A Paint Shop..... 348
Pintsch Side Lights for Suburban Coaches..... 350
CONTRIBUTIONS:
Surprise Inspection As An Aid to Discipline..... 337
Discipline and the Divisional Organization..... 337
EDITORIAL:
Electric Retrospect and Forecast..... 346
A Court-Made Amendment to the Coupler Law.... 346
President Mellen on Labor Unions..... 347
Editorial Notes.....346, 347
New Publications..... 347
Trade Catalogues..... 347
MISCELLANEOUS:
Talks With An Air-Brake Inspector..... 337
Russia's Railroad System..... 337
Foreign Railroad Notes.....342, 350
The Upbuilding of a Railroad System..... 342
Charles Storer Storrow..... 344
The Modern Steam Locomotive..... 348
American Railway Association..... 349
GENERAL NEWS:
Technical..... 350
The Scrap Heap..... 351
Meetings and Announcements..... 352
Personal..... 352
Elections and Appointments..... 352
Locomotive Building..... 353
Car Building..... 353
Bridge Building..... 353
Railroad Construction..... 353
General Railroad News..... 354

Contributions

Surprise Inspection as an Aid to Discipline.

Roanoke, Va., April 14.

TO THE EDITOR OF THE RAILROAD GAZETTE:

While there are other incidental essentials, no matter what else a railroad company may have, its prosperity depends upon the efficiency of its train service, which can be made efficient only by a high standard of discipline. This, in my opinion, can best be obtained by methods which will protect the good men and weed out the poor and undesirable ones, by making a distinction between the wilful violator of the rules and the one who unfortunately makes a mistake.

A high standard of discipline in train service depends largely upon thorough and proper road supervision, and in connection therewith, I am strongly in favor of secret or surprise inspection, in order to stop the violation of rules before it results in loss of life and damage to property, upon the principle that "an ounce of prevention is worth a pound of cure," and I believe that if railroad disciplinarians would exert as much effort to prevent accidents as to cure the evils that cause them, after the damage is done, very much more would be accomplished for the employees as well as for the employer. Eternal vigilance and foresight and not remedial measures, are the price of safety. My experience as to whether or not secret inspection engenders good or ill feeling upon the part of the men, owing to the objection wilful wrongdoers have to being watched, is that it depends entirely upon how it is inaugurated and pursued. While the tests are made without the knowledge of the men at the time, they should not be made without notice to them that such tests would be made periodically. An honest banker does not object to the unexpected visits of the bank examiner; the more he is checked the better he likes it. Similarly, the railroad man who is responsible not only for the value of property but for the safety of human lives, is, or should be, educated to realize that the object of surprise inspection is the protection of his life and position. We have obtained the very best results in every respect from secret tests, which have been practiced very generally on this line for a number of years, and I am glad to observe that all railroad writers now seem to agree that this method is essential and the best plan to insure maximum observance of the rules.

L. E. JOHNSON,
President, Norfolk & Western Railway.

Discipline and the Divisional Organization.

April 25, 1904.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with interest your editorials and excerpts from letters on the subject of discipline. Human nature is much the same the world over, and where the lack of discipline is found, it is due to the officers in charge, and the conditions under which the men work. I have been connected with the operating department of a large railroad for over 15 years, during which time, as superintendent, I was called upon to "clean up" three divisions, and as a general superintendent, to clean up two, and in every instance after a period of work from six months to two years was enabled to effect an improvement which resulted in a diminution of train accidents traceable to carelessness. If trainmen and enginemen be kept on duty long hours, without provision for sleeping and eating at the terminals away from their homes, and if they are dealt with on the principle of "an eye for an eye and a tooth for a tooth" there will always be a lack of esprit de corps, and disloyalty will reign. If on the other hand trains are so loaded that they get over the division in a reasonable time; if bunk and eating houses are provided at the terminals, with recreation rooms; if in every instance the man's record be looked up before awarding discipline, and if, added to this, the officers of the divisions travel freely on freight and passenger trains, are active in commending the men for exceptional good acts, and deal out discipline with kindness, the right thinking men (which are by far the larger class), will endeavor to do right and will assist an officer in keeping the other class up to their work.

When I first took charge of a division I worked altogether on the lines of surprise checking, but as I gained experience I found that it was possible to learn what was going on without resorting to surprise checking, which is most distasteful to men and breeds disgruntlement. I think the divisional organization produces the best results. In this organization the maintenance of way engineer, roadmasters, and all officers on a division, report to the superintendent. If the trainmaster's work be confined to the road exclusively instead of spending his time in terminals; if the superintendent travels frequently, and if the maintenance of way engineer, roadmasters, and bridge and building masters look upon themselves as officers, check, and report to the superintendent violation of rules, it will not take long to bring a division up to its proper standard. The division I have charge of now extends over a territory of 3,000 miles on which there are five superintendents and the discipline on each of these divisions exactly matches the calibre of the superintendent. In fact, so much depends on the superintendent and his assistants, that I venture to say I can tell the style of man any superintendent is, by spending a week on his division.

If railroad companies would hold the officers responsible for results instead of permitting accidents to be passed over with a report of the discipline dealt out, there would be a lessening of train accidents due to the carelessness of the men.

———, *General Superintendent.*

Talks With an Air-Brake Instructor.*

Student.—Bill Draper said he was firing for "Old Man" Mulligan a short time ago and somehow the handle of the brake valve got moved on to "lap," and when the "Old Man" wanted to stop—coming down into Jacksonville, which Bill says is a bad place and a very important station—he found that there was but about 30 pounds pressure registered by the black hand on the air gage. He pulled the handle around to the emergency position and called for hand brakes. They run through the station and about 2,000 feet beyond before stopping. They were pulling a fast train of six cars and had not made a stop for 50 miles, but had slowed down about 24 miles from Jacksonville and the brake worked O. K. when making the application. I asked him if the train pulled hard, and he said: "No, not at all, we made time easy." I don't understand how the pressure could leak out of the train line without causing the brakes to apply, and I told him so, but he insisted that the brakes did not drag. I wish that you would tell me what you think about it.

Instructor.—It is a fact that the air pressure may leak out of the train line and not cause the brakes to apply, but it must, at the same time, also leak out of the auxiliary reservoirs. The sensitiveness of the triple valves determines how fast this reduction can take place without causing them to operate and admit sufficient air to the brake cylinders to cause the pistons to be moved by the leakage grooves. A very sensitive triple valve will operate when the train-line pressure has been reduced very slightly, and the amount of air that leaves the auxiliary reservoir, reducing that pressure so that the train-line pressure will move the triple piston back and close the graduating valve, is not sufficient to cause the brake-cylinder piston to be moved by the leakage groove, and the air admitted to the cylinder will escape through the groove. With all sensitive triples this operation continues as the leakage in the train line continues to slowly reduce that pressure. Triples that are not sensitive will permit auxiliary reservoir pressure of air to flow through the feed port back into the train line, when the leakage from the train line is slow, without moving the triple piston. It would be impossible to say how many pounds the train line and auxiliary-reservoir pressure could be reduced, and not cause brakes to drag, in the time a train was running a certain number of miles, without making an actual test of that particular train.

Student.—Wouldn't it have been a wise thing to have moved the handle of the brake valve to full release position, instead of the emergency position, and charged the auxiliary reservoirs before applying the brakes?

Instructor.—I understand you to say that when at a point where an application of the brakes should be made he discovered that there was only about 30 pounds pressure in the train line and auxiliary reservoirs, or that was what the black pointer registered with the handle of the brake valve on "lap;" is that correct?

Student.—Yes, sir; that is the way it was told to me.

Instructor.—I believe, then, the "Old Man" did all right. The first duty of an engineer when he finds that he cannot stop with the air-brake power he has to apply, is to call for help from the trainmen, and their first duty is to open a conductor's valve and then apply the hand brakes. A train running, say 40 miles per hour, would not have the brakes applied until within half a mile of the point where it is to stop, and you can readily see that if an attempt was made to recharge the distance run would in all probability be greater than what it would be with the braking power available applied and hand-brakes called for. Had it been discovered that the air pressure in the train line was low before it was necessary to apply the brakes, I should certainly say that the handle of the brake valve should have been placed in full release and the auxiliary reservoirs recharged as much as possible before it was necessary to begin to apply the brakes.

Student.—With the air-brake applied, would the trainmen be of any assistance in stopping the train?

Instructor.—The hand and air-brake work against each other on passenger cars, as a rule, and the trainmen would be of no help in stopping the train unless they could apply more brake-shoe pressure than the air in the brake-cylinder developed. That is, with a brake applied from a pressure of only about 30 pounds in the auxiliary reservoir, a brakeman would very likely be able to apply a greater brake-shoe pressure by winding up the hand brake.

Student.—Bill Draper said that on his road they were drilling a warning port in the engineer's valve, which blows with the handle on lap, since this accident at Jacksonville occurred. I understand that this warning port is similar to the one we now have for full release position. Do you think this is necessary?

Instructor.—I cannot say that I think it is necessary, for an engineer would know by his gage that something was wrong, but I cannot see any harm in having such a port, and it might save an accident. Such a port would not relieve an engineer from watching the air gage, for it would not indicate low air pressure due to pump stopping or feed-valve attachment becoming inoperative. However, it would call his attention to the engineer's valve and the position of the handle would be noticed, and I believe on the whole that it would be a good thing to have.

Student.—"Smoke" Taylor told about a case that they had on his road, where the engineer expected to take on a helping engine at the foot of a grade and closed the cut-out cock under the brake valve before getting down to oil around. On account of trouble with the drawbar on the tender of helping engine it was decided, just before starting, not to take on a helper, and he forgot to open the cut-out cock again. The brakes were not tested, as the helping engine was not attached, and the rules, therefore, did not call for a test. There was no occasion to use the brake until the train had run about 12 miles, where the rules require a running trial before beginning the descent of a heavy grade, when he discovered that the cut-out cock was closed, and that the pressure in the train line and auxiliary reservoirs had leaked off so that it was quite low. However, there was plenty of room in which to slow down and recharge with the pressure available before pitching over the hill, and so no trouble was experienced. I was thinking that a warning port in lap position, or watching the gage would not in such a case have been of any assistance in indicating to the engineer the condition of things that existed.

Instructor.—No; you are right, a warning port in lap position would not have been of any value in such a case if the handle of the brake valve was in running position and, being in the habit of watching the gage, with the handle in this position, would not have told him that anything was wrong. The only remedy for such an oversight is a rule that requires the handle of the engineer's valve to be carried in the emergency position when the cut-out cock under the engineer's valve is closed. Such a rule will not only reduce the liability of such an occurrence as you have described, but it will also facilitate the application of the brakes from the rear engine in case of an emergency arising, for it will only be necessary to open the cut-out cock and an emergency application will be obtained. There is one thing that this case demonstrated, and that is the importance of the running trial before beginning the descent of heavy grades and approaching dangerous points. I am rather inclined to think that engineers in general do not consider the running trial of very much importance and, therefore, do not practice making it, although most roads to-day require it by rule. It appears to me that a rule requiring running trials of the brake should not be necessary, for an engineer should be sufficiently interested to know that he has open communication through the train line so as to operate a sufficient number of brakes and that these brakes are effective in retarding the speed, to make them without being required to do so by a rule.

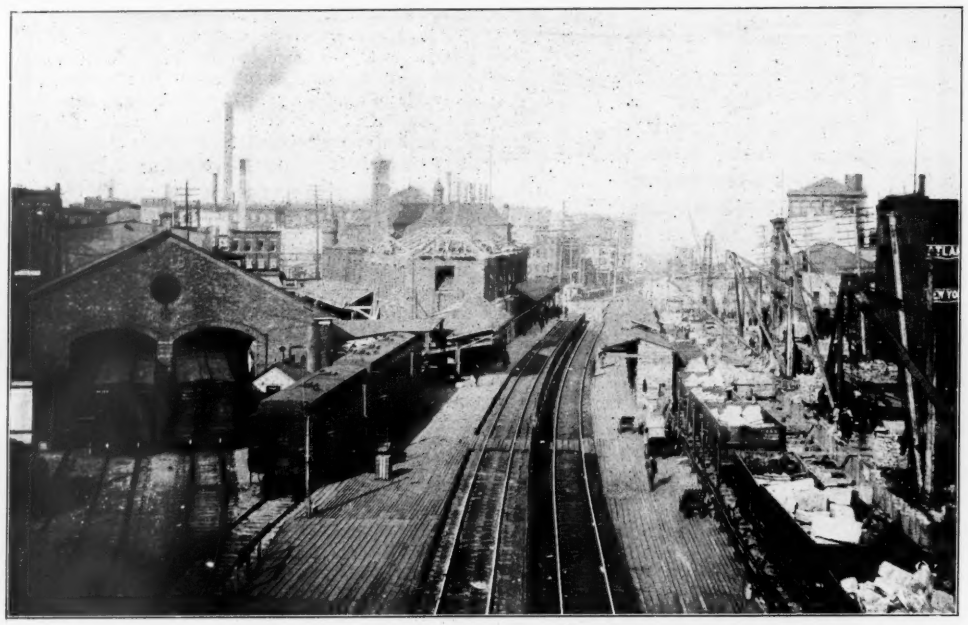
*E. G. Desoe, in the *Locomotive Firemen's Magazine.*

Russia's Railroad System.

The Bureau of Statistics at Washington has just issued a pamphlet entitled "Commercial Russia in 1904." The present condition of the Russian railroad system is given in this paper as follows:

At the beginning of 1902 the total length of all Russian

railroads (exclusive of those in Finland) was 35,187 miles, of which 28,982 miles were in European Russia 5,138 represented the length of railroads in Asia (exclusive of the Manchurian Railroad), and 1,067 were secondary railroads of local character. Of this total of over 35,187 miles, 23,557 miles, or over 67 per cent., were owned and operated by the Government. The value of this system, exclusive of the local secondary roads, is 5,149,399,000 rubles, or about 99,000 rubles per verst. Of this grand total expended in building railroads the Government's share is 4,914,805,000 rubles, or about 95 per cent. This amount includes the value of all corporate securities, both stocks and bonds, the income from which was guaranteed by the Government and the total amount of subsidies granted for the construction of railroads. On Jan. 1 last the length of the entire Russian railroad system, exclusive of 1,944 miles of railroads in Finland and 1,555 miles of the Eastern Chinese road, is officially stated as 36,673 miles. Of this total 31,493 miles were in Europe and 5,180 miles in Asia. Of the European railroads the Government operates 19,256 miles, while 12,266 miles were operated by private corporations. The total length of double-track roads was 6,830 miles. The length of roads opened for operation during the year 1903 was 446 miles and the total number of miles under construction was 3,931.



Market Street Station, During Track Elevation.

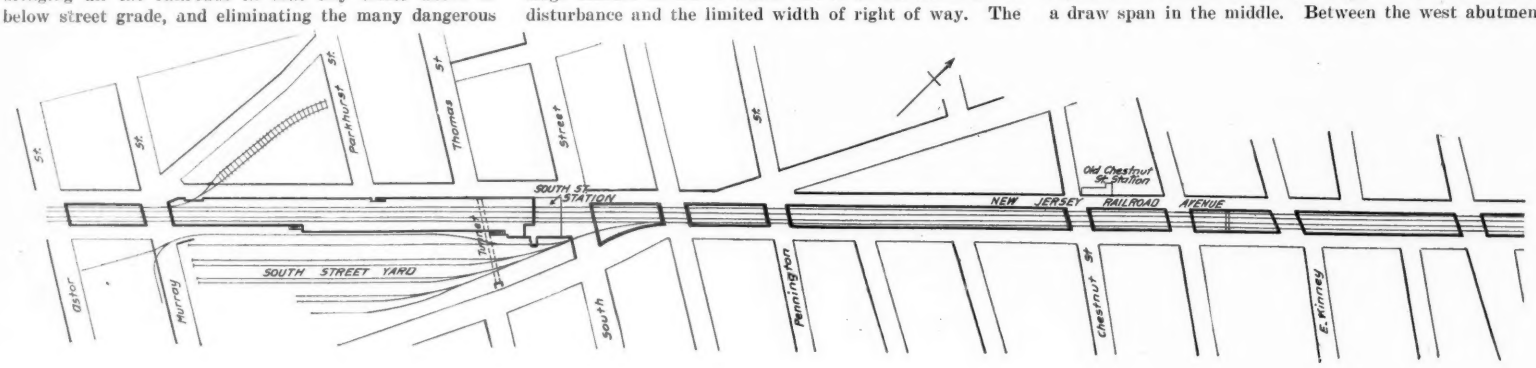
Track Elevation of the Pennsylvania in Newark, N. J.

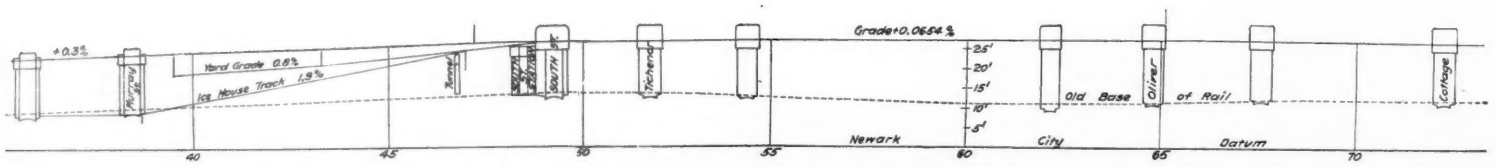
In December, 1900, the Board of Street and Water Commissioners of the city of Newark, passed an ordinance permitting the elevation of the tracks of the Pennsylvania Railroad and the Central Railroad of New Jersey inside the city limits of Newark. A year later the D., L. & W. was also empowered, under a separate ordinance, to elevate its tracks; thus, with one exception, bringing all the railroads in that city either above or below street grade, and eliminating the many dangerous crossings which existed heretofore. The one other line running into Newark—the Erie—crosses the Passaic river above the congested part of Newark and turns north through a comparatively sparsely settled district, where there are few dangerous grade crossings. The Erie has not taken any steps as yet towards elevating or depressing its tracks.

The work, which was planned three or four years ago by all of the lines concerned, is now nearly completed. A full description of the Lackawanna improvements was given in the *Railroad Gazette*, Nov. 27, 1903, page 839. All of the trains on that road are now running over the new elevated structure in Harrison, on the east bank of the Passaic, and the new passenger station which was erected at Broad street, is in use. Pending the abandonment of the Morris canal, which prevents the proposed depression of the Lackawanna tracks so long as it is still open, trains now run over the completed portion of the work as far as High street, and from there run out on the old level. The Lackawanna's work beyond High street consists of a concrete walled open cut, spanned with road and foot bridges at street crossings. The estimated cost of this improvement is something over $3,000,000.

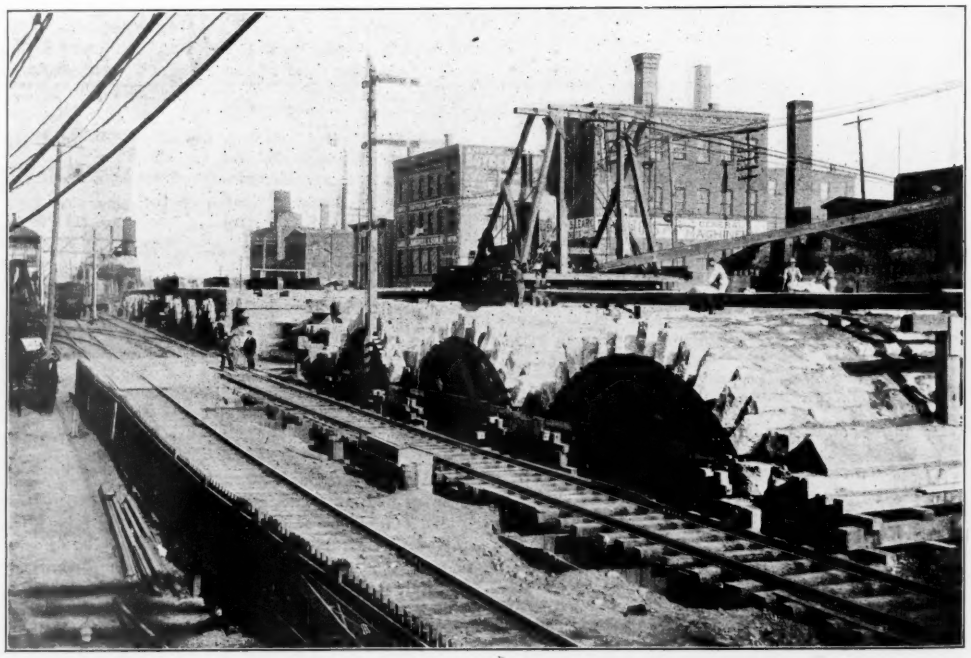
The Central Railroad of New Jersey had the least work to do of the three roads, the estimated cost of its improvement being $300,000. The only grade crossing eliminated was at Mulberry street, just south of the passenger station, where the tracks were elevated 6½ ft. and the street level was depressed 6 ft. The heaviest work on the Central's improvement was the lifting and replacing of the viaduct over the Pennsylvania's tracks just west of Market street station by the erection of 260-ft., three-span, plate girders. In order to give 16 ft. under clearance for the Pennsylvania, the new elevation of the tracks at this point was made 40 ft. 9¼ in. above the city datum. A number of improvements were also made in the freight and passenger terminal facilities of the Central. This work is completed, and trains are running over the tracks at the new level.

The Pennsylvania had the greatest and most difficult part of the entire work of all the roads, not only because of its magnitude but also owing to the large amount of traffic which had to be handled without disturbance and the limited width of right of way. The total length of track elevated was 16,000 feet, or about three miles, starting at a point in Harrison about a mile east of the Passaic River, and extending to the overhead crossing of the Lehigh Valley, near Waverly. Twenty-four grade crossings were eliminated, 21 being replaced by overhead bridges, and two by footway tunnels. The line from the beginning of the elevation in Harrison to the Passaic River was carried on an earth fill. The river is crossed by a swing bridge renewed about five years ago, which was raised to meet the new elevation. It consists of a fixed span at both ends with a draw span in the middle. Between the west abutment of the bridge and the Morris canal the elevation is on a solid fill between retaining walls. The line continues on to Market street over a series of stone arches. From Market street on, west, the elevated structure consists of a solid earth fill between rock range masonry retain-

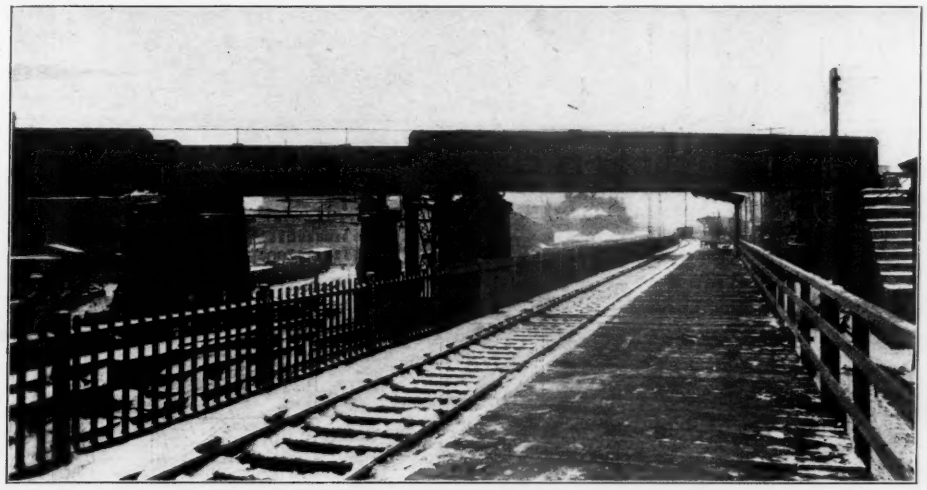




Plan and Profile of Newark Track Elevation, Pennsylvania Railroad.



Arches East of Market Street.



C. R. R. of N. J. Bridge Over Tracks West of Market Street Station.

ing walls, through plate girder bridges with solid trough floors over the streets.

The Harrison station on the Centre street branch was abandoned, and a new station built at Fourth street on the main line, to take its place. The station at Market street, Newark, has been entirely remodeled to accommodate the new track level, and a new station built at South street to take the place of the old stations at Chestnut street and Emmett street between which it is situated. The old station on the Centre street branch has been abandoned, and the traffic formerly handled at that point is now taken care of at the Market street station.

over the new elevated tracks, and for the present only two tracks have been laid between the east end of the elevation and the Market street station. Just west of the Market street station the two tracks are widened out into four, which continue on to Philadelphia. The retaining walls east of the Market street station have been built far enough apart to allow two additional tracks to be put in at any time when it is deemed necessary to do so, and east of the river it is only necessary to widen the earth embankment by depositing more material.

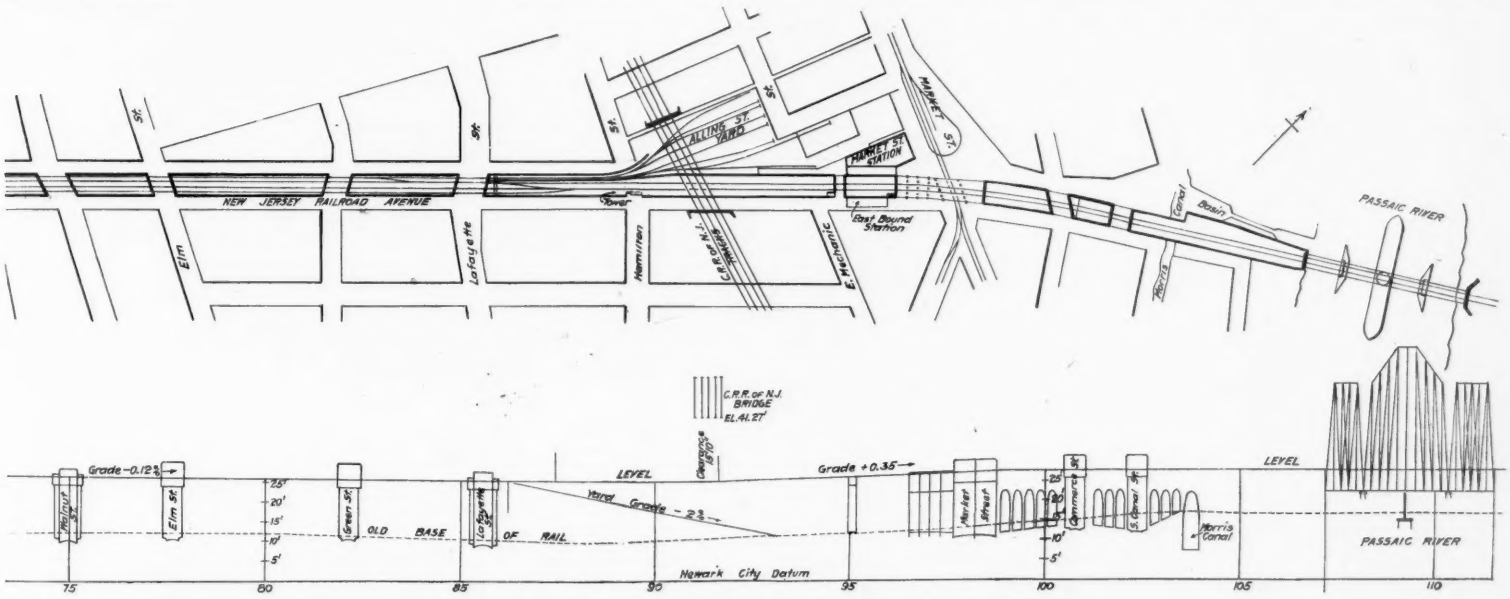
The accompanying drawing shows a plan and profile of the elevation between the Passaic River and the west

the retaining walls here, as all of the old grillage had to be removed and new pile foundations sunk in the mud without disturbing the old timber lock. Starting from the Morris canal and extending over to Market street is a series of low masonry arches, and also two plate girder bridges over South Canal street and Commerce street. One of the illustrations from a photograph shows these arches during construction.

Between the Market street station and Hamilton street, which has been closed, is the overhead crossing of the Central Railroad of New Jersey. This is a three span plate girder bridge—referred to above—carried on a stone abutment on the south, steel columns just north of the Pennsylvania's retaining walls, next a stone pier, and then a concrete abutment on the north. One of the photographs shows the completed bridge and another one shows the erection of one of the plate girders. The abutments and stone pier are built to accommodate four tracks, although up to the present time only three have been put in.

From Lafayette street the north track of the Pennsylvania descends on a 2 per cent. grade and forms a connection to the Alling street yard and the Adams Express Company's new depot which stands on the site of the old freight house. Two retaining walls are built in at this point, one of them being the continuation of the retaining wall along the north side of the Market street station, and the other one descending to the street level with the grade of the connection track. There will be six stub tracks in the Alling street yard, to be used for storing cars loaded with meat products, etc., for delivery to the warehouses situated adjacent to the yard. An additional track is carried into the Adams Express Company's depot and still another is carried down along the extension of the baggage platform of the passenger station.

At South street, in addition to the new station which has been built there, a large triangular piece of property,



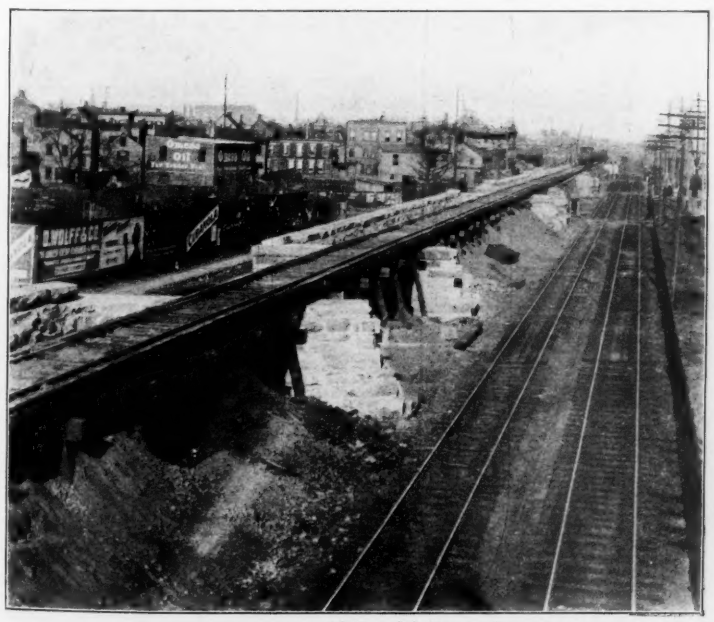
Plan and Profile of Newark Track Elevation, Pennsylvania Railroad.

In connection with the work of elevating the tracks in Newark, a new double track freight line five miles long was built from the Meadows yard, making a detour south of Newark, and connecting again with the main line at Waverly, just west of Newark. Formerly all of the freight traffic intended for classification in the Meadows yard and for distribution in Jersey City came through Newark. None but passenger trains will be run

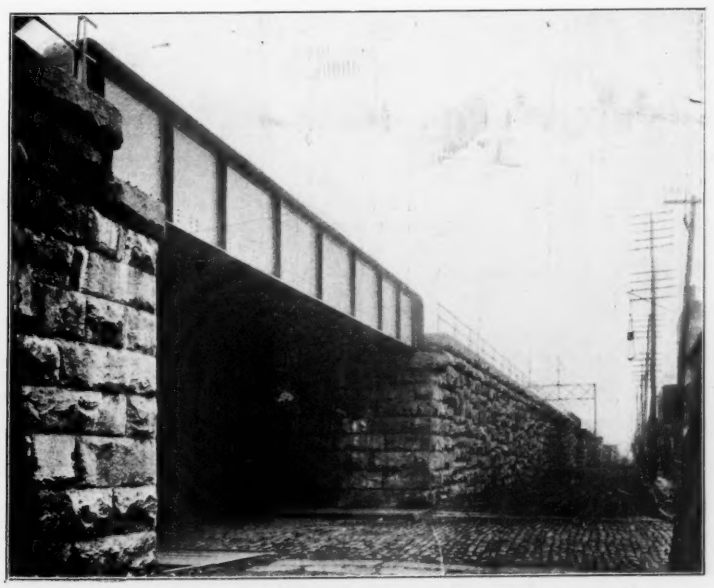
end of the new South street yard. The new base of rail over the river is 10 ft. 10½ in. above the old base of rail, and the average elevation through the city is about 14 ft. On the north side of the retaining wall, extending west from the abutment of the bridge, is a basin and lock for the Morris canal, which has an opening into the Passaic River at this point. Some very difficult foundation work was encountered in putting in

bounded by the main line right of way, Mulberry and Murray street, has been acquired, and a freight yard, with nine stub tracks, has been built on filled ground. The connection between the South street yard and the main line is carried over South street on a separate plate girder bridge just south of the four-track main line bridge.

The method used at the westerly end in building the

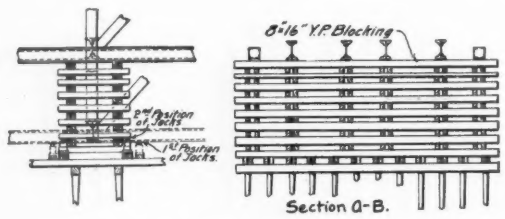


Construction Track on Trestle, and one Retaining Wall.

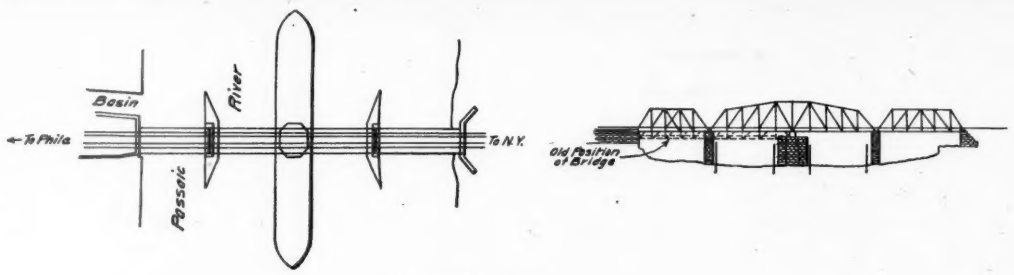


Finished Retaining Wall and Overhead Crossing.

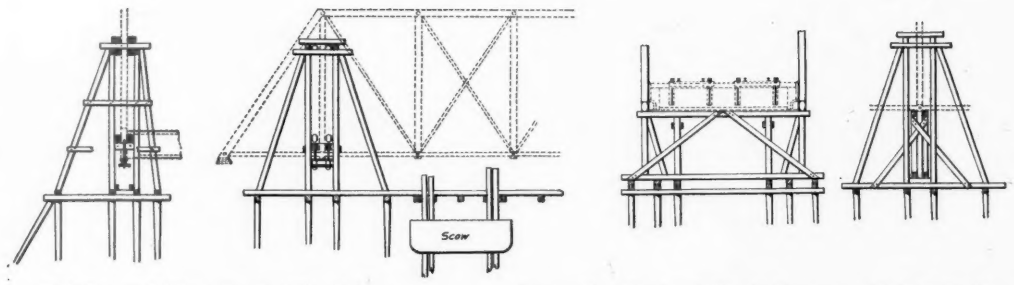
retaining walls and elevating the tracks without interfering with traffic is shown in one of the drawings. The two freight tracks, east and westbound, originally occupied the outside position, with the two passenger tracks in between. The two southerly tracks were shifted out partly into the street and brought together to 12 ft. centers instead of 16 ft. and used as running tracks, the roadway alongside of the right of way being reduced in width from 22 to 14 ft. The work was started at the westerly end, on the construction of the north retaining wall. After this wall was erected a long timber trestle to carry a construction track, and later, the eastbound trains, was built on the line of No. 3 track. From this trestle the embankment was made for No. 4 track, the slope running out under the trestle, and material was placed for the northerly half—two tracks—of the



Method of Blocking up Draw Span.



General Layout.

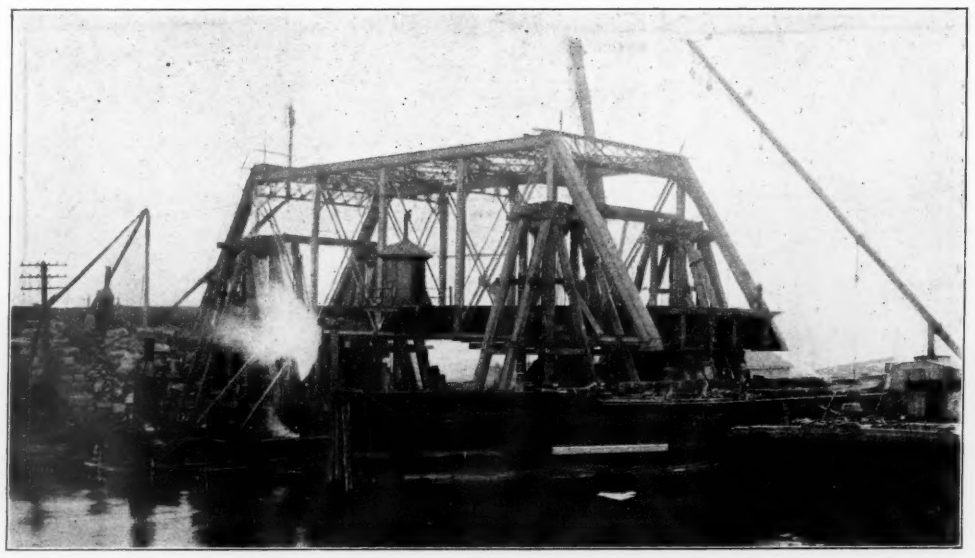


Details of Lifting Bents—Fixed Spans.

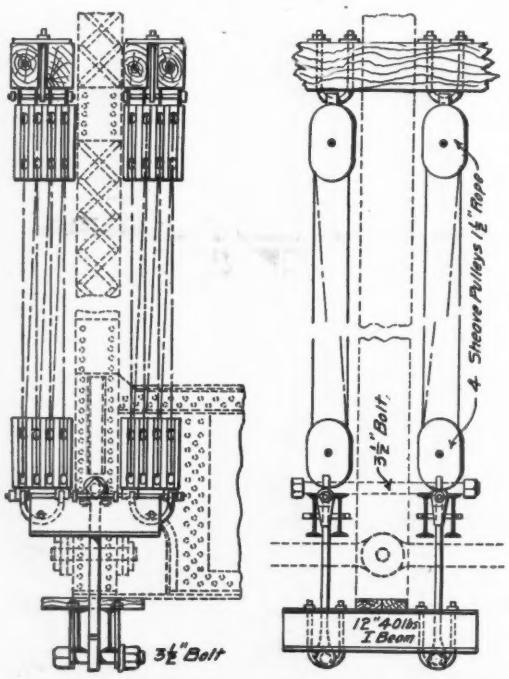
Supporting Bent —Bridge in Temporary Raised Position.

bridges and abutments. After the fill had been made, and the bridges for Nos. 3 and 4 track completed, east and westbound passenger traffic was diverted to these high level tracks, and the inside track on the old level was converted into a construction track. The south retaining wall was then erected, after which a light construction trestle was built on the line of No. 2 track. From this, the southerly half of the bridges and abutments were built and the balance of the embankment made. The shifting of the tracks from one side to the other was made without delay. One of the photographs shows the north retaining wall during construction, with the construction track on the trestle and part of the earth filling in place. Another photograph shows the Market street station during the erection of the south retaining wall. The hardest problem encountered in the work was handling the many passengers at the Market street station during the work of its remodeling and track elevation. Eastbound trains were run over the drawbridge until the time came to make the change at that point, and the westbound trains were diverted at a point east of Harrison to the Centre street branch, which crosses the Passaic river about 300 or 400 yards above the main line crossing. Later, when all traffic had to be suspended over the main line drawbridge all of both east and westbound passenger trains were moved around that way. On this branch there was a curve of 320 ft. radius, and it was single track over the Passaic river bridge.

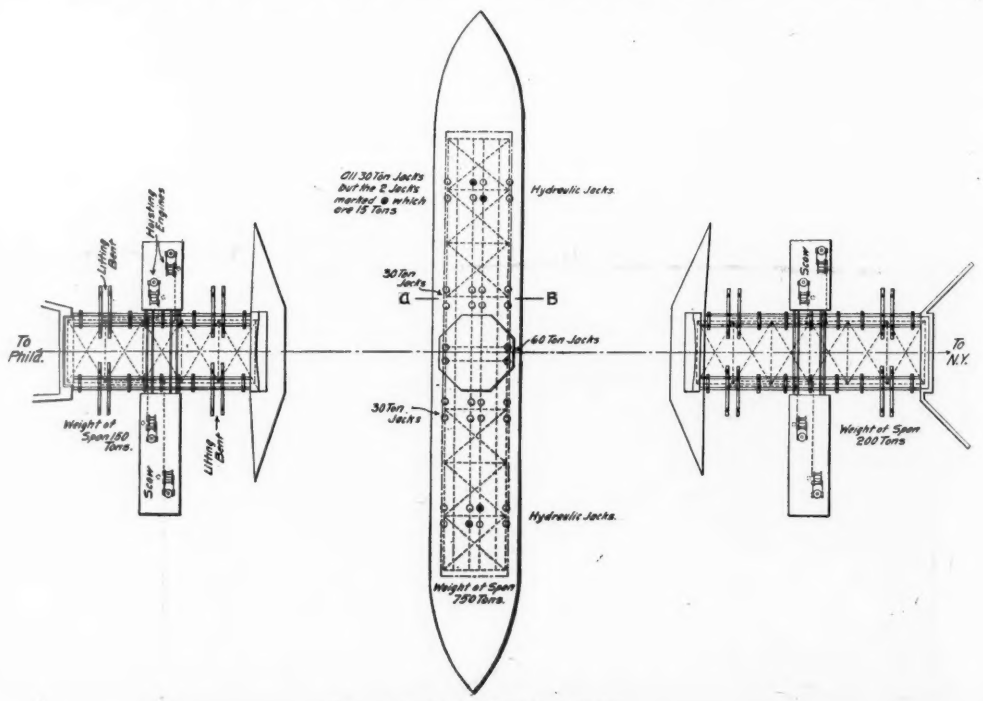
One of the most interesting features of the whole work was the elevation of the drawbridge. This work was done by the railroad company's forces under the direction of the Master Carpenter. The accompanying drawings show details of the method used. As soon as traffic was turned from the bridge a large force of men were put to work and the draw span was jacked up with 36 hydraulic jacks, supported on timbering laid on top of the draw pier fender, which had been reinforced and disposed under the span as shown on the drawing. Under each row of jacks a bed of blocking of 8 x 16 in. yellow pine timber and standard white oak crossties was built up, longitudinal blocks being placed under each stringer on the bottom chord of the side trusses. The two fixed spans were raised with block and tackle attached to the caps of lifting bents which were supported on piles driven in the river bed. The upper blocks were hung from the caps of the lifting bents with U-bolts, and the lower blocks were attached to a cradle of 12-in. I-beams built up under the vertical posts in the ends of the trusses. Two scows were anchored in the river and the ropes from the blocks, hung from each lifting bent, were wound on hoisting drums mounted on the deck. In lifting one of the fixed spans the ends were lifted alternately about 3 ft., and closely followed by blocking. When the spans reached the temporary height of 11 ft. 4½ in. they were blocked up with the supporting bents. When the new masonry on the abutments and piers was built in all of the spans were lowered by means of jacks to their final position 10 ft. 10½ in. above the old grade. The bridge was then ready to be thrown open to traffic; in the meantime, tracks having been laid to connect up with the new elevation on both sides of the river. The work was exceedingly difficult, as all of the spans had to be lifted instead of lowered, as was the case in the Lackawanna bridge further up the river, and the masonry had to be built up on top of the old piers while the trusses were carried on supporting bents and blocking. The weight of the east fixed span was



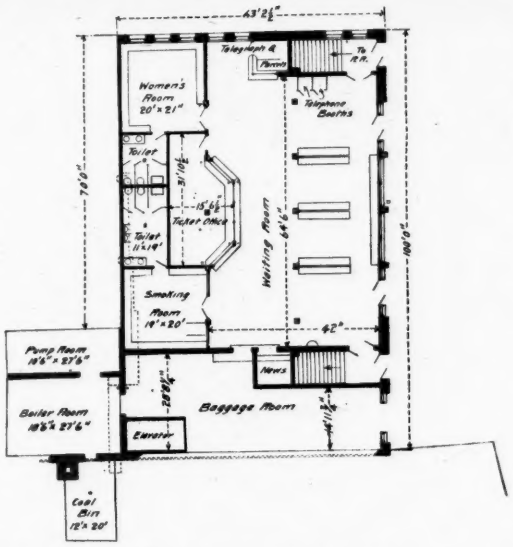
Lifting Fixed Span of Passaic River Drawbridge.



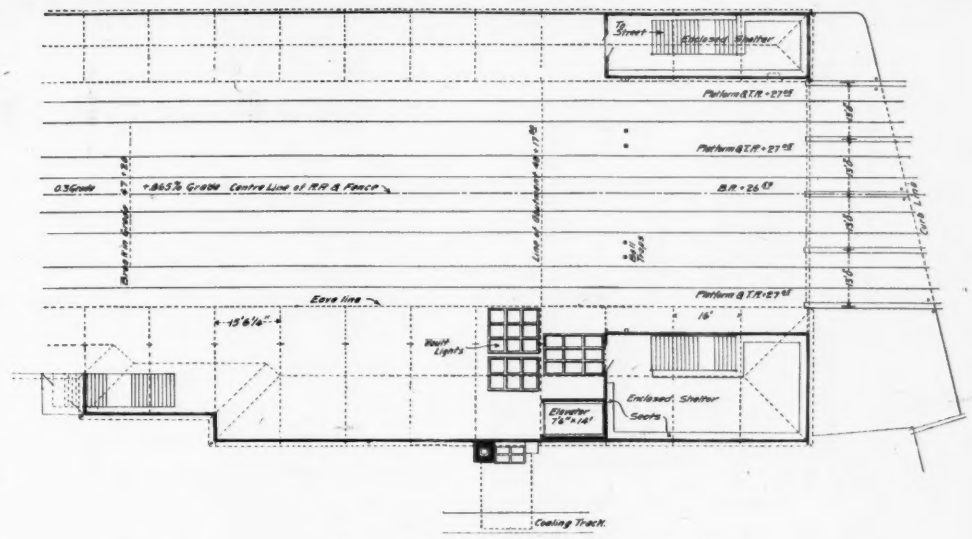
Details at Lifting Points—Fixed Spans.



Plan of Outfit for Raising Bridge.



Plan at Street Level, South Street Station.



Plan at Track Level, South Street Station.

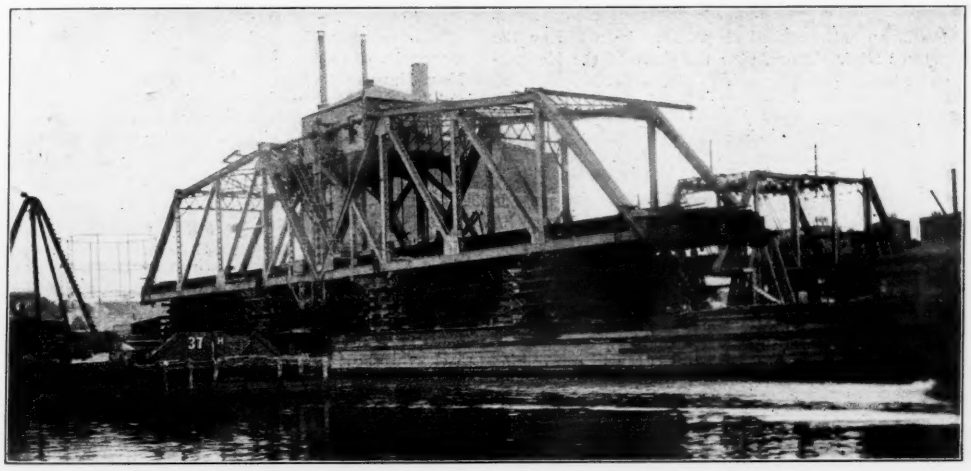
200 tons, the draw span, 750 tons, and the west fixed span, 150 tons.

The old station at Market street has been completely remodeled, and for a built-over station is remarkably convenient. The old station building occupied approximately the space shown on the drawing as first floor waiting room. The two-story addition at the west end and all of the platforms on the track level, as well as the eastbound station, are entirely new. There are entrances to the first floor waiting room from Market street and from the north side, facing the express company's building. The ticket office, news stand, and telegraph office are along the Market street wall. The toilet rooms for men and women and the store room occupy the space between the building wall of the station and the retaining wall on the north side of the track. The remainder of the first floor in the two-story addition is occupied by the baggage room. On the second floor, is a large waiting room, which opens out on to the train platform. It is reached by a passenger elevator and a broad stairway from the first floor. The space south of the station building and west of the curb line on Market street under the tracks forms a covered plaza; the floor above being supported on heavy steel columns. The entrance to the eastbound station is by stairway leading up from this covered plaza. An enclosed shelter house for eastbound passengers on a level with the train platform has been built out over New Jersey Railroad avenue. There is an exit to Market street from the east end of the eastbound platform and one to Hamilton street from the west end. An umbrella shed covers the entire length of both the eastbound and westbound platforms. Baggage from eastbound trains is carried down in an elevator and taken through a passageway under the tracks to the baggage rooms on the north side. All baggage for westbound trains is handled by a similar elevator on the north side of the tracks.

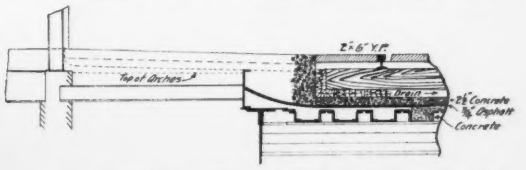
The space north of the station building and east of the Express building has been paved with asphalt to form a plaza or driveway for private carriages, while the new entrance for baggage and express teams is around the rear of the Express building. This relieves the congestion of teams in the vicinity of the station.

The new station at South street is of a peculiar design in that the main waiting room is directly under the tracks, and the entrance is from South street, which runs under the tracks. The One Hundred and Twenty-fifth street station of the New York Central is built on a somewhat similar plan. The accompanying drawings show the South street elevation and the north side elevation, with plans at the street level and track level. The ticket office is in the center of the rear wall of the waiting room and is flanked on the sides by the ladies' retiring room and the men's smoking room. Stairways lead from the sides of the waiting room up to the east and westbound platforms. The baggage room occupies the space along the south wall. There is an elevator leading up to the eastbound platform and any baggage for westbound trains is lifted up to the track level and taken over the baggage runway to the westbound platform. Back of the baggage room is a boiler room and pump room, to supply steam for heating and to supply power to operate the baggage elevator. The pump room contains a direct acting steam pump, and also a motor driven rotary pump which was put in as an auxiliary but which will probably be used for continued service, since only about 6 or 8 lbs. of steam are required in the boiler to heat the building, and there is no necessity of carrying 75 or 100 lbs. to run the pump. In the summer time, also, when no heat is required in the building, the fires in the boiler can be put out and power for the elevator supplied by the electric pump. There is an enclosed shelter for both the eastbound and westbound platforms, which is reached by stairways from the waiting room below. The platforms are covered with umbrella shelters and exit stairways have been built at the extreme ends of each. The roof of the station waiting room is a modification of the standard bridge floor, the troughed channels running parallel with the rails instead of transversely, as in the bridge floors. A detail of the roof is shown in the drawings.

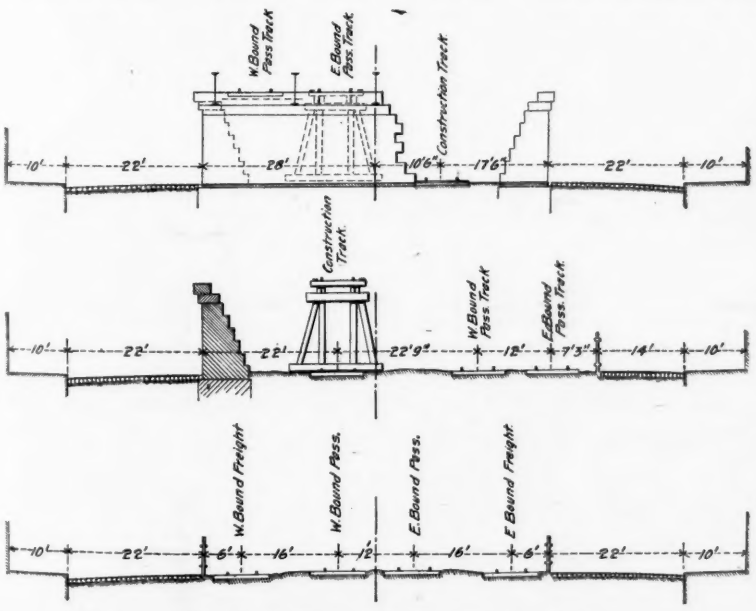
The work on the elevation was begun in April, 1901,



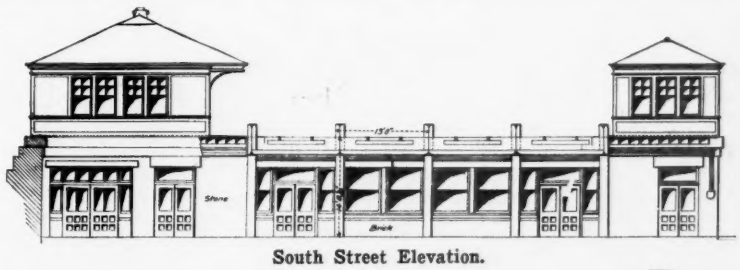
Jacking Up Draw Span Over Passaic River.



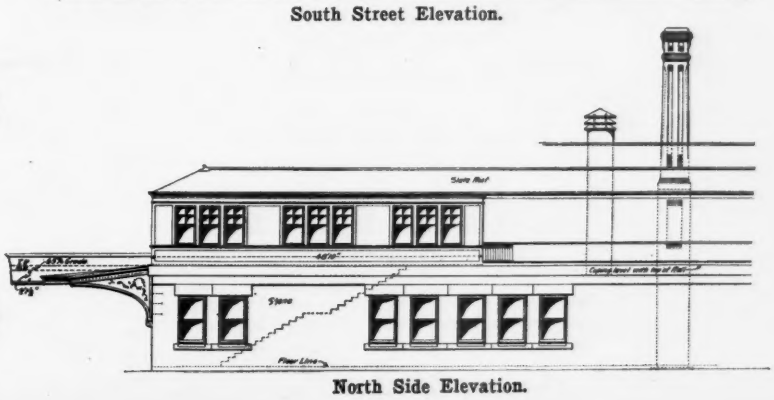
Detail of Track Floor Over South Street Station.



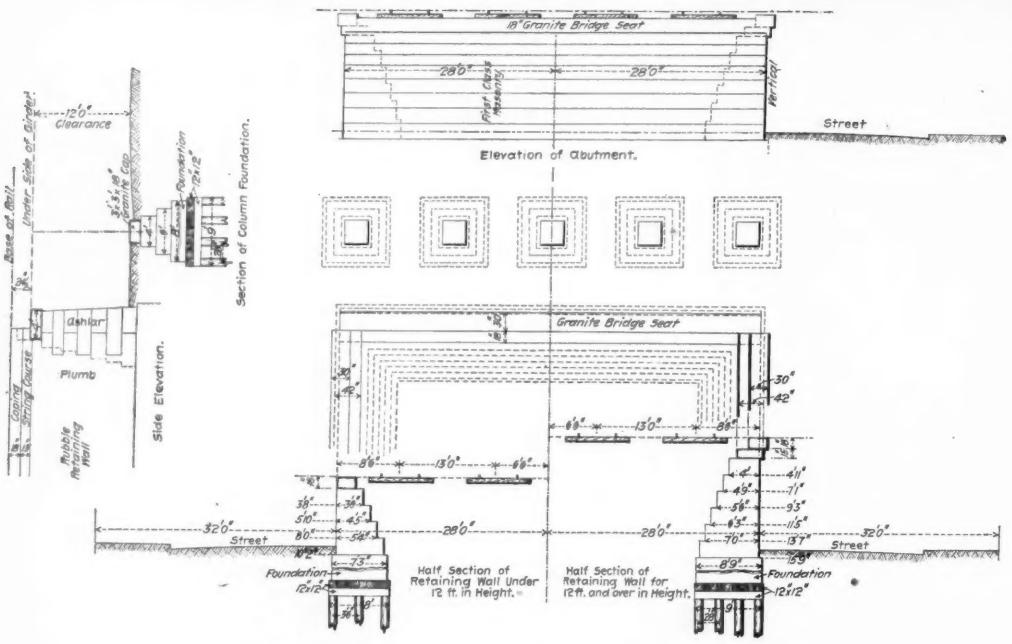
Sketch to Show Method of Raising Tracks.



South Street Elevation.



North Side Elevation.



Newark Track Elevation—Details of Retaining Wall and Abutments.

and is now completed, except that permanent stone ballast will be laid this summer after the fill has settled well into place. The city of Newark has derived incalculable benefit on account of increased safety to life and freedom from congestion and delay at the numerous crossings. The suburban and through passenger train service has been greatly benefited by the change and when the improvements now under way and contemplated at other points in New Jersey are completed a considerable reduction can be made in the running time between New York and the south and west.

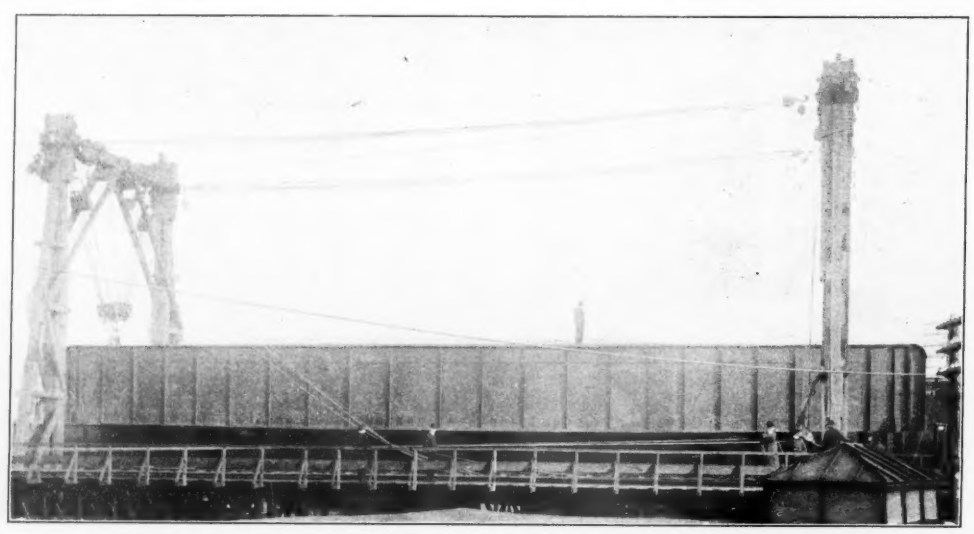
We are indebted to Mr. L. H. Barker, Principal Assistant Engineer, and Mr. E. B. Wilson, engineer in charge of the elevation, for the drawings and information courteously furnished.

Foreign Railroad Notes.

The French railroads, unlike the German, have had generally smaller earnings this year than last.

There is an astronomical observatory on a hill on the outskirts of Nice, France, near the shore of the Mediterranean, where magnetic observations were made and telegraphed to Paris daily. A street railroad has been built at the foot of the hill, and since it has been operated magnetic observations have become impossible. Suit was brought against the street railroad company, and it has been condemned to pay about $19,000 damages, and, in addition, the cost of whatever may be necessary to restore to the observatory its ability to make magnetic observations.

Naples offers a charter for a system of city railroads, with five different lines radiating from a central point, three of them for some distance underground. Altogether there are to be about nine miles of road. There are to be elevators from the underground stations, and the central one is said to be 314 ft. below the surface, which is not easy to believe.



Newark Track Elevation—Erecting Plate Girder Bridge, Central R. R. of New Jersey.

The Upbuilding of a Railroad System.

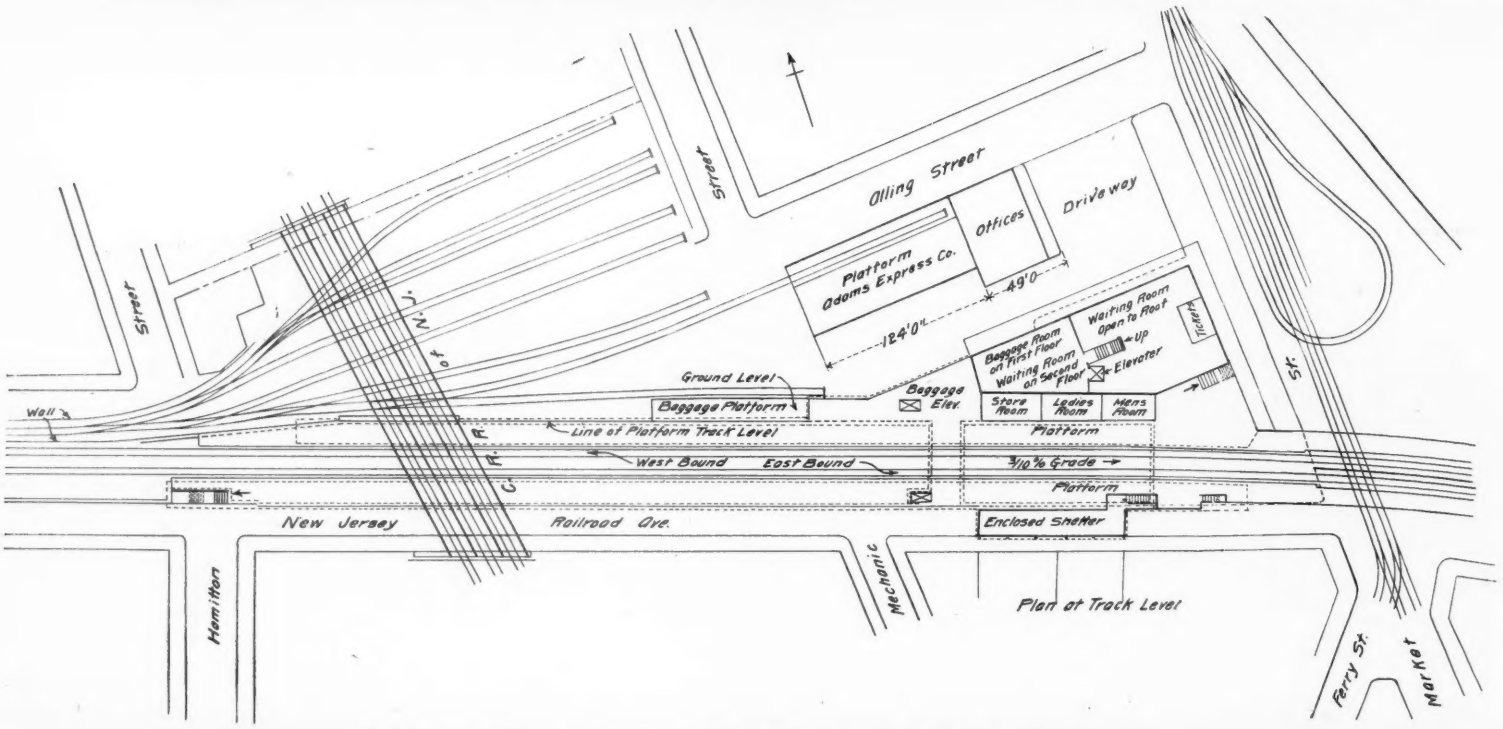
BY CLARENCE DEMING.

(*Concluded from page* 317.)

With the close of President Clark's official life the New Haven system had become on a large scale a monopoly in Southern New England. It held, by ownership or lease, all the steam railroad lines of southeastern Massachusetts and in Rhode Island, except three or four short and unimportant local branches; and, in Connecticut, practically all the steam lines except the New London Northern and the Central New England—and it owns the latter now. But, generally speaking, the New Haven system has been a monopoly not only as a whole but, locally at least, in its constituent parts. Except as modified by steamboat competition the history of such lines as the original New York & New Haven, the New Haven & Hartford, the Housatonic, the Naugatuck and the rest has signified local control of freights and fares and a large excess of non-competing over competing points. The results of such a monopoly, both in generality and in detail, is a profitable study.

SOME BENIGN RESULTS OF MONOPOLY.

Whatever may be individual views on the principle of monopoly, there can be no question that in the case of the New Haven Company it has created a deeper sense of public responsibility and has been fruitful of public benefits. Even in such legislative bodies as those of Connecticut and Rhode Island the "monopoly" cry has been the stock in trade of opponents of the corporation, has fathered parallel schemes and has operated visibly as a force on the plans of the great corporation. In Connecticut, for example, the corporation would have dared much more in its dominance of the General Assembly and its agencies in State politics, if its monopoly had been less vivid. As a still larger target for "monopoly" attack the corporation, in its concrete and immediate relation to the public as travelers has had to be responsive and concessive. Of the 40 lines, or more, originally independent, which the corporation has absorbed, a large number had been small local branches with service meagre, irregular and bad. Once taken up by the "monopoly," the branch line service, equipment, roadbed and stations have been improved and often in direct answer to local demand. In the general operation of the system the same facts, partly as the result of unity and relative economy in operation, have been evident on a much larger scale, attested historically by such proofs as quicker and more frequent passenger service, better cars, four-tracking, new and costly stations, and abolition of grade crossings. It is probably within the truth to say that, during a temporary period of trade depression, the reduction of the corporation's dividend (1896) from 10 to 8 per cent. would hardly have come



Newark Track Elevation—Location Plan of Market Street Station, Newark, N. J.

except as the indirect resultant of costly public improvements stimulated by the "monopoly" outcry.

EFFECTS ON FREIGHTS AND FARES.

The outworking of monopoly in fares and freights in the case of the New Haven system is much more difficult to trace. The system has been for years in rapid transition and owing to the classifications of freight and the readjustments of rates and fares, as new lines have been absorbed, it is impossible to follow the shifting figures. But the annexed table for comparison with the Boston & Albany and Boston & Maine, taken from this year's report of the Massachusetts Railroad Commission, is significant:

Average Freight Rate per Ton-Mile.

	1870.	1880.	1890.	1900.	1901.	1902.	1903.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Boston & Albany	2.19	1.21	1.11	.82	.83	.97	.97
Boston & Maine	4.45	2.56	1.76	1.44	1.13	1.12	1.13
N. Y., N. H. & Hart.	4.09	2.41	2.07	1.45	1.48	1.46	1.41

Average Passenger Fare per Mile.

	1870.	1880.	1890.	1900.	1901.	1902.	1903.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Boston & Albany	2.78	2.09	1.86	1.75	1.74	1.72	1.73
Boston & Maine	2.14	2.14	1.83	1.73	1.76	1.76	1.77
N. Y., N. H. & Hart.	2.38	1.92	1.73	1.78	1.76	1.74	1.73

Disturbing factors in any analysis of the figures will be easily noticed—such as the low ton-mile rate of the Boston & Albany due to its large ratio of low classified through freight from the West and the fall in the Boston & Maine ton-mile rate in 1901, due to the same class of business on the Fitchburg line, newly acquired—while trolley rivalry has probably affected the passenger rate on all three roads in irregular and uncertain ratios. On the other hand, the increased through freight traffic from the West of the New Haven Company must be allowed for. Taking the progressive reductions through the tabulated years the New Haven does not suffer in the comparison, especially in passenger rates. For the period since and including 1896, when, by control of the New England road, the New Haven monopoly in Southern New England territory was confirmed, we find that the figures appear as below for rate per ton-mile in cents:

	1896.	1903.
Boston & Albany	.94	.97
Boston & Maine	1.53	1.13
N. Y., N. H. & Hartford	1.57	1.41

while in passenger fare per mile the following are the returns:

	1896.	1903.
Boston & Albany	1.75	1.73
Boston & Maine	1.79	1.77
N. Y., N. H. & Hartford	1.76	1.73

The comparison for the eight years proves that the New Haven carried its freight at a decidedly reduced rate, the Boston & Albany showing a positively increased return, while the new Fitchburg business vitiates any comparison with the Boston & Maine—the Fitchburg, by the way, during the year 1900, the year before it was absorbed by the Boston & Maine, carrying freight at the low rate of eight-tenths of a cent per ton-mile. In passenger rate reductions the returns for the eight years show the New Haven ahead of both the other systems. The Boston & Maine is in no sense so complete a territorial monopoly as the New Haven, and the Boston & Albany, whose old conservatism in taking in connecting lines is a familiar fact, is no monopoly at all. When it is remembered that the New Haven, in response to popular demand and not by statute or charter restriction—as in the case of the New York Central—has voluntarily established directly or by mileage book a two-cent passenger rate on its whole system, the outcome of its "monopoly," in its relations to public necessity and convenience must be regarded as very satisfactory.

ELECTRIC POLICY—TROLLEY COMPETITION.

The story, necessarily condensed, of the general policy and specific methods of the New Haven Company in meeting electric competition forms a most striking chapter in its history. It is the tale of a long and often bitter contest in the legislature and the courts of Connecticut—much less so in New York, Massachusetts and Rhode Island, though in all three States there have been sharp electric rivalries; while, apart from legislatures and from judicial findings, there has been the policy of fighting electricity with its own weapon.

The first onset of the trolley upon the interests of the steam company took place in Connecticut in the year 1889 under the Presidency of C. P. Clark and found the great corporation, and, for once, its alert head, asleep. The then novel agent of electricity on street railways, the economies of the new motive power, its capacity for smooth operation and speed and its attraction for the traveling public were undreamed of by the steam railroad managers and, indeed, only half realized by the trolley promoters themselves. Then came the legislative deadlock of 1891 and a total gap of four years in all kinds of lawmaking—a period during which existing trolleys could demonstrate success but during which no new trolley ventures could be chartered. But on the legislature of 1893 they descended in a flood and the long contest began which even now is not closed. In the first year following 1893 the Connecticut trolleys, operating over short distances as parallels of the steam roads, were almost deadly in their effects on local passenger traffic. Counsel for the New Haven Company at a committee hearing in 1895 presented a table which is of value not only as showing the "deadly parallel" of the trolley at that early stage, but also because it is the only table of the kind which the New Haven Company has allowed to be published. It compares six months of operation during 1894 with six months' operation of the following year against trolley rivalry on fourteen routes averaging each only about four miles. The table is annexed, the percentages showing decrease of passenger traffic based on the six months before trolley competition was encountered:

	Decrease of passengers.	Decrease, per cent.
Bridgeport and Stratford	16,479	70
New Haven and West Haven	1,585	19
New Haven and East Haven	3,416	61
Meriden and Yalesville	10,766	78
Hartford and Rocky Hill	991	13
Union City and Waterbury	20,017	87
Naugatuck and Waterbury	42,621	88
New Haven and Woodmont	5,305	62
Bridgeport and Southport	5,131	25
Meriden and Wallingford	9,689	28
So. Norwalk and Rowayton	11,792	35
So. Norwalk and Winnipauk	706	87
Derby and Ansonia	254	10
Birmingham and Ansonia	1,620	13
Total	130,372	54

In only one of the foregoing cases was the competing trolley line between cities.

In Massachusetts an able and conscientious railroad commission enforcing radically the law of "replacement value" of trolleys as a bar to overcapitalization and with a definite policy in regard to trolley construction has prevented that State and its legislature from becoming hot battlefields of steam and electricity, and, in Rhode Island, electrical interests appear from the first to have controlled a too obedient legislature. But in Connecticut in 1893 all the local conditions favored a long and virulent steam-trolley contest. There was a flaccid railroad commission unwilling even to exercise its statutory powers over street railroad returns; nearly two-thirds of the population of the State in the cities and large factory towns created such centralities of population as were peculiarly alluring to trolley enterprise; the large local passenger traffic of the New Haven Company was very vulnerable to trolley attack; and there was an ardent popular desire for new electric railways to "open up" the suburb, the rural town and the farm. In all these elements combined the great steam corporation found a foe to which it slowly had to yield. It won some initial success. A general street railroad law was passed which sent new parallel trolley projects to the courts for determination of the question of their public necessity and convenience; a good many serious parallels were defeated or delayed to be renewed and chartered later; and one or two temporary victories were won in the courts. But, as a whole, the record of ten years has been one of steady retreat before the advancing trolleys. In the year 1893 there were but three inter-urban electric lines in the State. In 1904 there are twelve such lines and out of the eighteen cities of the State only four have no outside urban connections by electric road.

The absolute results of electric parallel competition on the passenger business of the New Haven Company are hard to estimate. But, as one test and measure, it may be noted that in the four years 1895-8 inclusive the number of passengers carried on the whole system fell from 43,838,676 to 41,464,748, passenger mileage, however, rising from 747,008,728 to 759,632,395 and the average distance traversed per passenger from 17.04 miles to 18.32 miles, with passenger receipts about stationary at $13,204,838 in 1895 and $13,453,499 in 1898. These returns, however, cover a period of considerable industrial depression as well as initial trolley competition. It seems a fair inference that during a series of years the effect of electric rivalry, allowing for some economies in consequential reduction of local train service, was to cut off the company's business from its normal passenger increase. But, in later years, the first result of the competing trolleys as parallels has been offset by their function as feeders, and earlier losses have probably been made good.

ELECTRIC VENTURES AND FORECASTS.

With defeat in the legislative and judicial conflicts of Connecticut clearly forecast as an ultimate the New Haven Company, under President Clark and his successor, President John M. Hall, turned early attention to a physical policy in resisting electric rivalry and entered, almost as a pioneer, into electric ventures of its own. Its plan was twofold: (1) To interrupt threatened long distance parallels by purchase of local trolley systems of cities along its line and (2) to meet competition by electrification of some of its own steam lines. In 1895 the Nantasket branch in Massachusetts—a "summer" line—was electrified with third rail—an interesting experiment but to prove a failure in the end. The Stamford and Meriden trolley systems were bought up outright, to be profitable investments, quite apart from their obstructive value. A track of the Highland division for some eighteen miles from Hartford to Bristol was electrified by third rail and, on the face of its returns, has shown very low operating expenses and passenger business much increased over that of the old steam road—but its discontinuance is possible if the Highland division is to be further double-tracked for increased through freight traffic via the Poughkeepsie bridge. The Providence, Warren & Bristol line was electrified by trolley and during its few years of operation has returned a great and increasing passenger business. Under President Hall was undertaken the novel experiment in self-parallelism of the Norwich & Worcester division—a freight road—with a trolley line some 50 miles long, a great power plant driven by water, the property too highly bonded and controlled by the New Haven as a holding company with small investment in stock. It contains the germ of a scheme for electric lateral freight feeders to factory villages but its exceptional problem is yet to be worked out. Finally has come the recent purchase for about $9,000,000 by President Mellen of the Fair Haven & Westville, the most valuable trolley system in Connecticut, comprising all the street railways of New Haven and adjacent towns. The summary of the foregoing electric ventures shows the New Haven in possession of electrified road representing considerably more than 300 single track lines and returning rather more than $1,600,000 of annual receipts. No railroad corporation in this country has entered upon electric operation on so large and varied a scale: and the future of the New Haven seems big with promise of electricity on its main lines, "bunching" of cars from the larger cities into trains and other revolutions of traffic which, if President Mellen's published forecast is fulfilled, will make the steam locomotive a relic.

No subtle analysis of the record and results of the long steam-trolley conflict in Connecticut is required to prove that the policy of the New Haven Company in fighting parallel street railway charters in the State legislature and the courts has been a mistaken one. Had the great steam corporation, instead, used the physical policy, fought electricity with its own arm, and used its own power at the State Capitol to compel honest financiering of trolley projects, the company would have greatly reduced trolley parallel extension and incidentally served the public interest as well as its own in a State where capitalization of electric roads reaches some $83,000 per single track mile as compared with $48,621 in Massachusetts.

FREIGHT DEVELOPMENT IGNORED.

But a far more persistent and harmful error in the history of the road has been its treatment of the freight traffic down to a period not earlier than two years ago. The subject demands full and exhaustive discussion.

The narrow policy of ignoring freight development reaches back to the very inception of the road and spans almost the whole of its more than half century of life. The road was first conceived and built as a passenger line. Freight in the early and middle forties was carried between New York and New Haven by boat in seven or eight hours and could endure the slow transit which the traveler could not endure. A gain of four or five hours for the traveler represented at least the same industrial vantage that a gain of two or three hours does now. Such a state of affairs started the "passenger" tradition which was to remain so obstinate a flaw in the New Haven directorate. Its earliest visible germ appears in the first equipment of the newly opened line with its 46 passenger cars costing $88,608 and freight cars so few that they are not even enumerated by themselves but grouped with "baggage freight, flat and hand cars" costing altogether but $36,700. As the financial history of the road proceeds the meagre freight business of the company becomes apparent. In 1852, the year before the Norwalk disaster, it brought in but $120,315 as compared with $666,283 from passengers; seven years later but $189,144 with $776,961 from passengers and three years later still $181,092 with $694,753 from passenger fares. The passenger *motif* as an influence on the managers, from President down, became well nigh hypnotic and even in that day was coined the delusive maxim that passenger traffic was the get-all because it "handled itself;" and men still very young can remember the legend "no freight received after 4 o'clock P. M." big lettered on the freight stations of the corporation. What opportunity was lost then in the days of cheap land to secure expansive plots for freight yards must be a melancholy reflection for the company now. How slow, even in later times and with the absorption of large freight carrying systems, has been the relative development of freight traffic is shown by the annexed table covering 16 years:

	Freight receipts.	Passenger receipts.
1888	$5,648,184	$4,118,370
1889	6,001,465	4,192,361
1890 (9 mos.)	4,425,504	3,465,781
1891	6,649,986	4,673,630
1892	6,903,279	5,010,421
1893	9,807,545	8,115,524
1894	14,858,328	10,423,546
1895	15,298,055	12,309,953
1896	16,274,100	13,296,584
1897	15,967,864	13,340,213
1898	15,901,669	14,081,856
1899	18,384,830	18,381,848
1900	19,764,754	20,164,753
1901	19,853,093	19,804,700
1902	21,223,630	21,871,642
1903	22,953,017	23,926,150

Not until last year by any considerable volume of traffic did freight pass passengers in the race.

Other figures confirm strikingly the diagnosis of a belated and at times reactionary policy as to freight business. In 1867 the company had 450 freight cars. The number had fallen in 1869 to 418 and two years later had risen only to 434, freight receipts rising from 1867 to 1871 from $321,511 to $442,027. The company was thus doing about one-third more freight business with 16 fewer cars. In 1874 the company had 1,120 freight cars and in each of the next three years only 1,130, freight business remaining about stationary. In 1883 the company begins to "lease" freight cars to the number of 150 and they appear in the returns for five years after. The low condition of the freight rolling stock is suggested by the reduction—presumably by destruction—of 746 freight cars in 1898 under the administration of President Clark, when the freight rolling stock falls from 11,881 cars to 11,135 cars—but the reduced number attended by $14,081,856 of freight receipts as compared with $13,340,213 the previous year. Such figures bear graphic testimony as to the extent to which the company was using the cars of other roads in its business—but that is another story.

Read between the lines and up to two years ago the history of the company has been a dismal tale of rolling stock in the freight service systematically neglected, cars defective, old fashioned and deficient in number, inadequate bridges and failure to provide yards, sidings and switching facilities. There are bright spots, such as President Clark's traffic agreement and development of the Harlem terminal, but even that active and otherwise progressive administrator, fell far short in some of the most fundamental elements of freight operation.

CAR DETENTION AS A NEMESIS.

The New Haven Company's property has been and is a kind of gigantic terminal in its physical relation to the great trunk lines leading to the West and Southwest. This alone has created a situation favorable to excessive car detention. But, added, has been the unique demurrage law of Connecticut—alone, it is asserted, among the States of the Union in having such an act on its statute books. The act provides that no railroad company operating or owning a railroad in that State shall "claim, demand or collect, from any shipper or consignee of merchandise or freight, any sum, damage or charge for the delay or detention of cars in loading or unloading for any period of less than four consecutive days, Sundays and legal holidays excluded." The four days must be computed from the time the cars become accessible to the shipper or consignee for the purpose of loading or unloading. The statute was passed in 1889 when the New Haven Company, in the stress of the great "parallel" fight, heretofore described, dared not oppose it and indeed did not foresee its ultimate outworking. In practice, as the New Haven Company cannot discriminate and establish one rule in Connecticut and another in Massachusetts and Rhode Island the statute reaches the two latter States and involves the other railroad systems as well as the New Haven. Quiescent and ignored, so long as the New Haven company could detain the cars of the western trunk lines under the old six-mill mileage charge the statute, doubtless unjust in itself, was presently to spring into life as a kind of avenging Nemesis.

The blow that was to penalize the New Haven company for many old sins of commission in its freight department fell early in 1902, when the American Railway Association substituted the per diem charge of 20 cents per car a day for detainage in place of the six-mill mileage rule. President Hall, fully aware of what the new regulation signified in its bearing on his company's net earnings, urged in vain President Tuttle, of the Boston & Maine, to join him in resistance to the per diem charge, and had the Boston & Albany not been under New York Central control, he might have succeeded in forming a New England territorial combination against the new rule. The next step was to introduce in the Connecticut legislature a bill modifying the four-day demurrage act so as to give two days free; charge two days additional to the consignee; and add a dollar a day for each added day's detention. The hearings in committee with their volleys of cross-questioning threw, as upon a luminous screen, the errors of New Haven freight management reaching back through the years—decrepit cars and not enough of them, slow and irregular train work, torpid service of arrival notices, cars "warehoused" by the mile at Fall River for the cotton brokers, other cars stagnant for weeks on minor sidings, and yet other cars of the bereaved trunk lines put in commission for the New Haven's local service—in short, all the easy going traits of an individual in placid enjoyment of another person's property. An illustrative story of the time was that of a great railroad magnate with large vested interests in New York Central, and himself a director of the New Haven, whose heart waxed hot within him and who spoke bitter words when he saw in Rhode Island from the observation window of the directors' car a box car of the major corporation, not too much out of repair, shunted to the roadside and adopted as the dwelling of a colored family. It may be said also that at one of the hearings Vice-President Todd confessed the "local service" abuse but insisted that it had been extinct for two years.

DEFEATS BY THE FARMERS.

The arguments of the opponents of the proposed change in the Connecticut law were pretty tenuous, except as they were based on the traditional defects of the New Haven's freight service which at the time President Hall and Vice-President Todd were doing their best to rectify. It was shown that there was "bunching" of cars in large consignments which could not be unloaded in the prescribed time, but it was proved *per contra* that much of the bunching was done on the western trunk lines, and that the problem was a hard one for the New Haven to solve; and there were some minor grievances of a localized and temporary character which the officers of the company promised to redress. The opposition came at first from a number of mercantile and manufacturing bodies, but most of them changed front and favored the measure. Not so, however, another body whose resistance finally killed the bill. There had arisen in the legislature a "farm" combination practically controlling the lower house and "caucusing" each week on bills that affected the farm interest. This organization—representing also the State grange, buying grain and feed by the wholesale at the West and distributing it by carload to members—resisted stoutly the change alleging the advantage of the old law to farmers living at a distance from stations; and the bill, predestined to defeat unless the company made a costly appeal to the lobby, was withdrawn without reaching a vote. At the hands of the same organization, and in exactly the same way was thwarted a New Haven measure to repeal the general railroad law of the State so as to check a threatened "long distance" electric parallel between Hartford and New Haven. But, with the per diem rule, in 1903, its first year of operation, costing the company by official returns $1,237,622 net as compared with $780,214 net by the mileage plan in 1902, another appeal to the legislature next January is certain.

After the reverse of the New Haven company in the legislature, President Hall signified his intention of testing the constitutionality of the four days detention law. It was proposed that the company charge for the last two days and, if the consignee refused to pay, force a suit to test the question whether the extra detention of cars of foreign companies under the law was not a violation of the interstate commerce act. It was reasoned also that, if the law was declared a valid State enactment, then, without violation of the interstate act, the loss might be made good by a terminal or switching charge. Ultimately, this expedient seems to have been abandoned, and the loss of the per diem was partly offset by an increase of freight rates—how far cannot, for obvious reasons, be stated.

VICE-PRESIDENT TODD'S FREIGHT INNOVATION.

It was not until some two years ago that President Hall, with Vice-President Todd afterwards as adviser, began the first systematic effort in the history of the New Haven Company to cure the rooted errors of its freight policy. Large purchases of locomotives and cars, special and extensive development of the coal traffic and acquirement of water frontage and expansion of export trade at Boston by English lines—a traffic valuable at least for business in westbound "return" cars—were some of the elements of the policy. But a larger and more successful measure is to be credited to Mr. Todd. When he came to the New Haven system early in 1893 he found it with about 700 non-competitive stations and 50 competitive stations, with every trunk line connection taking several empty cars westward to one car loaded. He found also that producers at the 700 non-competitive points, many of them large factory centers, were indifferent as to routes taken for westward shipments, provided it made no difference in the rate. Using, therefore, as far as might be, the long haul for westward freight over his own lines he traded it for eastward freight to competitive points. The great area of the New Haven monopoly with many local stations and a producer of high-class freight is thus used as a kind of vast trading counter for securing long hauls and freight to competitive points like Worcester and Boston. It testifies to the inertness of the New Haven in the evolution of its freight traffic that so obvious an advantage of territorial control should have had to wait so long before it was used. But other great tasks, the heritage of old inaction and lack of foresight, remain, which President Mellen is shouldering now with his plans for modern freight equipment, stronger bridges and heavier trainloads. Coupled with his great electric problems ahead and the scheme for freight business at Poughkeepsie bridge they herald, under the New Haven's first President who is, in a modern railroad sense, an operating manager, perhaps the most interesting chapter in the corporation's long and varied history.

HISTORICAL LESSONS.

In that history there are minor episodes which can be picked out here and there. For example, the annals are not complete without allusion to H. L. Goodwin, mild-eyed but iron-hearted, who by a personally conducted law suit brought the company to book for tax evasion, whose polemics for thirty years enlivened the annual meetings, and whose death brought forth resolutions of eulogy from a legislature that had always spurned his counsels. But it is not on such minor events in the life story of the upbuilding of a great railroad system that the eye of the reader pauses. It sees, rather, the deeper lessons of its corporative history. It notes the basic line born in trouble yet surviving great accident and greater fraud. It sees the small local monopolies welded into a great monopoly, yet the monopoly, in this case at least, responsive to public demand, and thus atoning somewhat for the corruptions of its legislative lobby. The vision of the railroad critic also observes the futility of resisting electric invention by new laws and judicial decrees, and marks the grave fiscal results of the New Haven's persistent error in neglecting freight traffic. Finally, in its broadest and most general outlines, the eventful history of the unique corporation teaches the unwisdom of one-sided railroad development, the value of the long look ahead, and that the railroad president who builds strongest for the future builds also for the best.

Charles Storer Storrow.

In the personal column of this issue mention is made of the death of a former roadmaster of the New York Central, whose career was practically co-extensive with that of the locomotive engine in America; but before the ink of that paragraph is dry we have the news of the death of another man whose service to the country, in the railroad field, began even earlier; who was a civil engineer under George Stephenson, on the Manchester & Liverpool, and who was the first Superintendent of the Boston & Lowell, the earliest passenger railroad in New England. We mean Mr. Charles Storer Storrow, the distinguished civil engineer, who died at his home in Boston, April 30, at the age of 95.

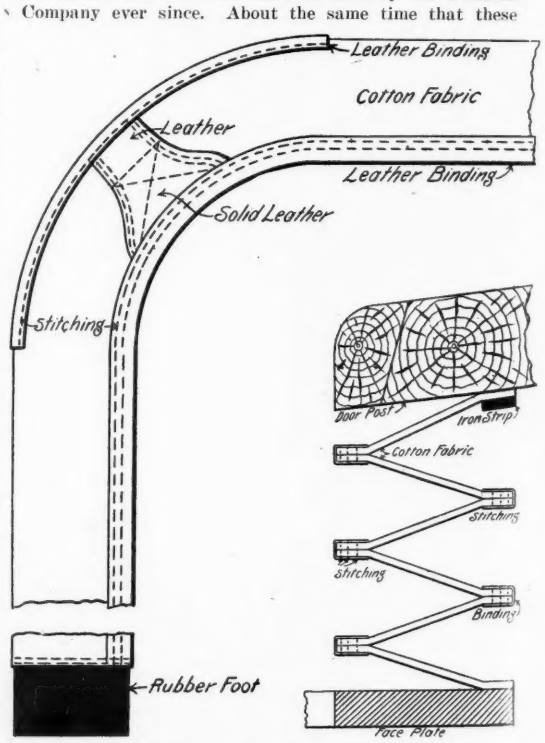
Mr. Storrow was born in Boston, March 25, 1809, and was graduated from Harvard at the head of his class in 1829; the same class with Oliver Wendell Holmes, Benjamin Pierce and James Freeman Clarke. Having the friendly influence of General Lafayette young Storrow went to France, and there entered the leading engineering school of the world; but before completing his course he left and went to England and took service under Stephenson. After a short time he returned to Massachusetts, and was chosen to superintend the building of the Boston & Lowell. This road, with its granite sleepers, was completed a little earlier than the Boston & Worcester and the Boston & Providence. Mr. Storrow's work in the railroad field is, however, but a part of his eminent services to the world as a civil engineer. About 1844 he resigned his railroad position and undertook the development of the water power of the Merrimac River at Lawrence, Mass., one of the great engineering monuments of the time and of the State. Mr. Storrow has been spoken of as the best educated engineer of his time in America, and his work at Lawrence testifies to the accuracy of this view. The canals and other works were so accurately designed that they have remained adequate and well adapted to their uses up to the present time, and the dam, 900 ft. long, stands to-day without ever having cost a dollar for repairs. Mr. Storrow was the author of a treatise on "Water Works Construction" which was a pioneer in its field. His use of cement and concrete in rubble masonry and his tests of cement were original departures. He was one of the founders of the city of Lawrence and was its first mayor; he was a member of the State Commission to complete the Hoosac Tunnel and of the Commission which began the modern park system of Boston. He was urged to become the head of the Lawrence Scientific School at Harvard College at its beginning, his advice to Mr. Lawrence having been a chief factor in the establishment of the school.

He was an honorary member of the American Society of Civil Engineers.

Mr. Storrow was General Manager of the Essex Company of Lawrence until the end of his active business life, but he had lived in Boston for many years. His wife and his son, James J. Storrow, both died many years ago.

The "Climax" Vestibule Diaphragm.

Although the canvas vestibule diaphragm is a comparatively recent commercial product, the use of canvas belting for diaphragms is not new. The first full-sized sectional model of the Pullman diaphragm was made of canvas belting riveted together; the second was of rubber belting cemented together. The latter form was preferred and has been the standard used by the Pullman Company ever since. About the same time that these



The "Climax" Vestibule Diaphragm.

diaphragms were brought out Wagner vestibules were equipped with a sewed canvas diaphragm, some of the original of which are said to be in service still. Some roads, including the Santa Fe, Rock Island, North Western, Northern Pacific, and Chicago, Milwaukee & St. Paul, began the use of sewed canvas diaphragms about 15 years ago, but the type had only a limited use up to 1903, 95 per cent. of the diaphragms being rubber. In the last three years the proportion has rapidly changed, until the figures have become reversed. The lower first cost and great durability of the canvas diaphragms have given them a great advantage over the rubber, the average life of the latter being about 2½ years.

The latest design of canvas diaphragm to be brought out is the "Climax," illustrations of which are shown. A number of points of structural superiority are claimed for it. Ordinarily it is bound with belting leather, the grain side being turned in and the split side out, as the latter is capable of being more thoroughly water- and weather-proofed. Where especially requested, rawhide or other binding can be used. The number of sections per leaf has been reduced from five to three.

In designing the corners the primary object was to pre-

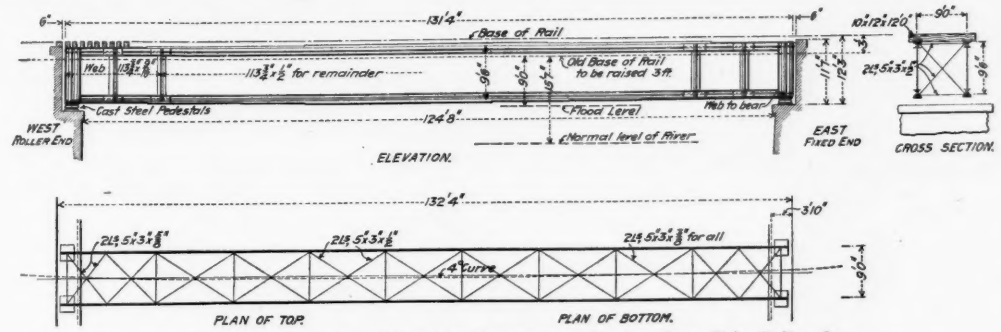
vent sagging, a difficulty experienced with some earlier forms. The construction adopted is shown by the engravings. The inner edges of the top and side sections meet at right angles and in the corner thus formed is inserted a solid leather fillet triangular in shape, to each side of which is glued a suitably-shaped leather belt, extending the width of the sections. These welts and the canvas are securely sewed through with two heavy parallel lock-stitch seams, after which the heavy binding is applied, effectively framing in the sections. The diaphragm is triple sewed throughout with a lock stitch of eight-strand Irish linen thread. One seam is sewed through the edges of the canvas belting before the binding is applied, completely protecting it. The other two seams, spaced about ¼ in apart, pass through the binding. Where rivets are asked for on the Pullman type, one of the seams is omitted to make room for them.

To provide for errors due to shrinkage or variations in car heights and to provide a durable wearing part where the diaphragm rubs against the lower buffer plates, and at the same time to permit the bottoms to be trimmed to a proper fit and prevent the material from unraveling, the legs are finished off with feet of rubber packing. The complete diaphragm presents a substantial and mechanical appearance.

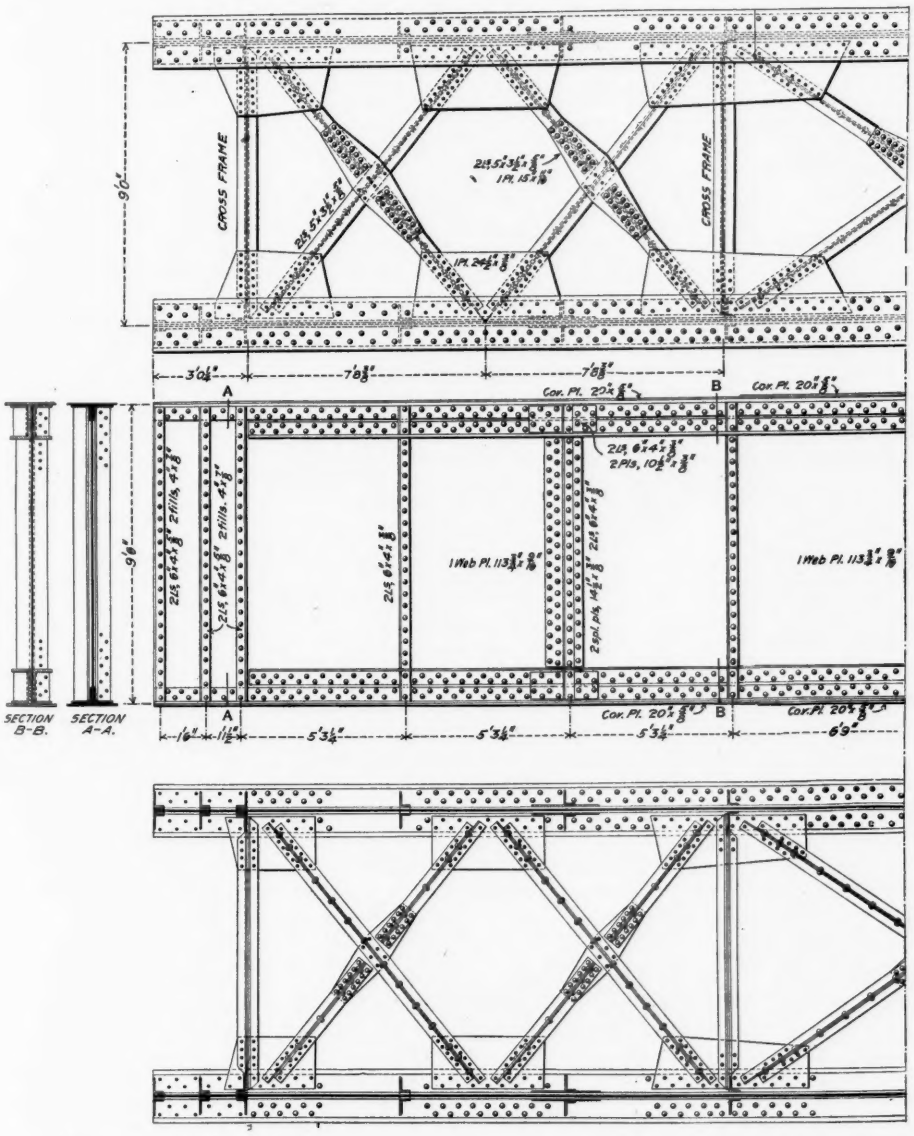
The "Climax" is made by W. H. Salisbury & Co., 109 Madison street, Chicago, the diaphragm department being in charge of Mr. Fred F. Bennett.

A Large Plate Girder Bridge on the Erie.

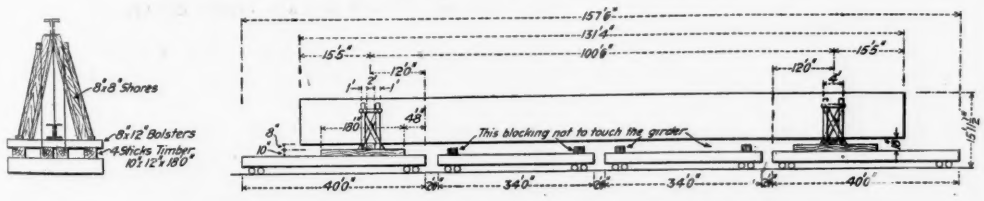
The Erie Railroad has recently erected and put in service what is perhaps the longest span plate girder railroad bridge in the country. It is a single track deck bridge on the main line over Yankee Run near Hubbard, Ohio, and is 131 ft. 4 in. long over the ends of the main girders.



General Drawing of Plate Girder Bridge over Yankee Run, Erie Railroad.



Details of End Panel of Plate Girder Showing Top and Bottom Laterals.



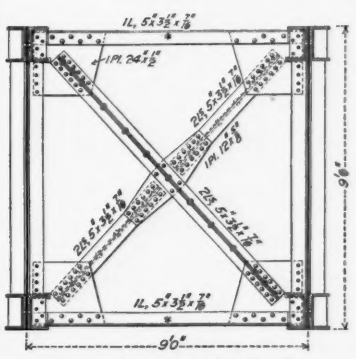
Method of Loading One of the Girders for Transportation.

was only 9 ft. below the base of rail. By putting in a shallow plate girder and raising the grade about 3 ft. the bottom of the bridge was brought up 1 ft. above high water level. The accompanying drawings show the general plan of the bridge and details of the main girders and cross-bracing. The main girders are 9 ft. 6 in. deep over backs of flange angles and are spaced 9 ft. apart. They are divided into nine panels with a cross frame of 5-in. x 3-in. x ½-in. angles built in at each panel point. In the middle panels which are about 13 ft. 6 in. long the lateral bracing consists of a pair of diagonals in both the top and bottom systems and in the end panels of two pairs of diagonals. These laterals are made of two angles riveted back to back and connected to the girders with wide gusset plates riveted to the flange angles. The web plates are 113¾ in. x 9/16 in. in the end panels and ½ in. thick in the middle panels. They are spliced in the center of the panels with 14-in. x ⅜-in. inside and outside splice plates. Stiffening angles, 6 in. x 4 in. x ⅝ in. are riveted on inside and out over each web splice and at the panel points.

The flanges are made up of four 8-in. x 6-in. x ⅞-in. angles, arranged in an I-section. Each angle is spliced once but the splices are distributed along the length of the girder so that no two angles in the same flange are broken at or near the same point. The flanges are covered with a single cover plate, 20 in. x ⅝ in., over the end panels, increasing to four such plates at the center. The cover plates were spliced in accordance with the following extract from the specifications: "Where necessary to splice cover plates, do it by extending the outer ones over the theoretical lengths shown on the drawings and let the added length in each case run at least 4 ft. beyond the splice. Do not stop any cover just short of a web-splice. Carry it over."

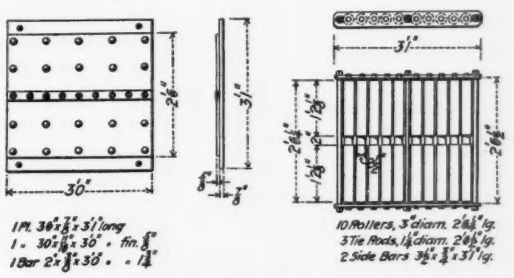
The end shoes are cast steel, 20 in. wide and 36 in. long, the bottom flange of the girders resting directly on them. A 4-in. pin carries the load from the top shoes to the bottom shoes which on the east or fixed end bear on the abutment. On the west end the bottom shoe rests on a nest of ten rollers, 3 in. in diameter and 2 ft. 6½ in. long. These rollers are notched in the middle, ¼ in. deep and 2 in. wide to take the guide bar formed on the top of the base plate and the bottom of the end shoe.

The proper elevation of the rails for the curve on the bridge is obtained by blocking up under the ties with hard wood tapered blocks. These blocks are notched over the girder flanges and bolted to the ties, but the floor system is not in any other way attached to the main members of the bridge.



Cross-Section and Detail of Cross-Bracing.

Each girder was erected complete in the shops of the American Bridge Co. at Elmira, N. Y., and mounted for shipment to the bridge site on four flat cars, both girders being hauled in the same train which was run "special." They were mounted on two cradles on the end cars as shown in the drawing, with intermediate blocking on the other two cars to carry the load in case the end supports failed. Both girders were shipped without accident and were unloaded alongside the track near one end of the bridge. After being erected and connected together with the laterals and cross frames, the whole bridge was moved out over the stream alongside the old bridge, being supported on timber falsework. The old bridge, was jacked up on cribbing built in the bed of the stream and temporary blocking abutments built for it, ready to receive it when the new bridge was pulled in place. Some changes in the abutment masonry were necessary and when these were made the old bridge was pulled out to one side and the new structure slid in place. Traffic was suspended only about an hour while the change was being made, the actual time for moving the old span out being about 10 minutes and the same length of time taken for moving the new one in.



Details of Bed Plate and Rollers for Expansion End.

We are indebted for the drawings and information to Mr. M. R. Strong, Bridge Engineer of the Erie, under whose direction the bridge was designed.

An old and light through truss bridge of the same span was removed and the new structure which is designed for a loading of the heaviest engines and cars was substituted. A number of large span plate girder bridges have been put in on the Erie during the last few years, one on the Bradford Division which was erected in 1899 being 128 ft. 3 in. long over all with girders 9 ft. 6 in. deep.

The line crosses Yankee Run in a sag with a 4 deg. curve on the bridge. Because of the curve it was thought best to use a deck bridge but the flood level of the water

The Paris underground railroad in 1903 carried 100,107,631 passengers, which was 60 per cent. more than in 1902. There are two classes of cars, and the second-class tickets sold were seven-tenths of the whole number. The gross earnings were $3,554,424, or an average of 3½ cents per passenger journey.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
PUBLISHED EVERY FRIDAY
At 83 Fulton Street, New York.

EDITORIAL ANNOUNCEMENTS.

CONTRIBUTIONS.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

ADVERTISEMENTS.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

A trainmaster who is responsible for educating conductors and brakemen up to the highest attainable efficiency can profitably devote some of his attention to teaching them the amenities of their work. A workman must not only be at peace with his boss if he is to perform his duties in the best manner; he must be cheerfully so; armed neutrality is not sufficient. A paragraph in Accident Bulletin No. 10, recently issued by the Interstate Commerce Commission and reprinted in the *Railroad Gazette* last week notes that the rear collision at Kentwood, La., in November, killing 32 passengers, was partly due to the failure of a brakeman of a passenger train to promptly go back with red signals, and to the failure of the conductor to order the brakeman back. This calls to mind more than one instance, recently observed by the writer, where the tail-end man of a passenger train got so "hot under the collar" when the conductor told him to hurry back with his signals, or watched his movements with a critical eye, that his growling was an offense to the passengers. Where passengers spend half their time while on the train in criticizing the railroad company—as they do on some suburban trains—it is unfortunate to thus give them what they think is a good ground for criticism—evidence of a flagging system that does not work smoothly. Going back with a flag may or may not be necessary in a given instance, but the brakeman who does not go promptly and without remonstrance when the conductor desires him to go needs a sharp lecture. If a conductor is over-cautious it is a matter for discussion in the trainmaster's office, perhaps, but not one for debate when an order has been given and is waiting to be carried out. If a brakeman thinks that flagging is not a serious enough business to require the oversight of two men (himself and the conductor), he should be taught the importance of the principle that governs in requiring the conductor to look after his brakeman. This principle is not that the brakeman is grossly incompetent, but that, in a matter where a slight error of judgment may have disastrous consequences, two judgments are deemed necessary. If two are ordered two must be exercised. Where two men have different views as to when a flag is needed, the only safe rule is to act on the judgment of the one who would send it earliest. We may admit that often the conductor will order out the flag when none is needed; but does not the same criticism lie against the flagging rule itself? The brakeman must never give himself the benefit of a doubt. Going back a thousand times, when his going does no specific good, is just what he is hired for.

In suggesting to a trainmaster that he make conductors and brakemen behave more pleasantly toward each other, we are asking him to undertake a task which may demand time, and tact and trouble. The Kentwood collision suggests another duty, which does not thus test the officer's judgment and his knowledge of human nature, but which may severely test his grit—his courage to adhere to a rule when by suspending it he can almost surely secure a temporary advantage. We mean the duty to have a rule forbidding the employment of men of too limited experience on passenger trains. The brakeman, who probably could have prevented the Kentwood collision if he had rushed back promptly with his red light and torpedoes, had been in the train service only five months. Of course, we do not know but the engineman was so grossly negligent that nothing less than torpedoes 30 telegraph poles in the rear would have stopped him; we do not know but this brakeman had passed 100 per cent. in his examination; the fact remains that some of a brakeman's most valuable knowledge is acquired only in the school of experience; and this schooling period should be passed in that part of the service where there is the least danger of his doing harm; that is on freight trains. This is, indeed, the unwritten law, or at least it formerly was so. The duties of passenger trainmen have come to be in so many respects different from those of freight trainmen that it is to be feared that the law is now not only unwritten but often is unobserved. Inexperienced men figured also in other collisions in Government Bulletin No. 10. Collision No. 1, killing 17 men, is charged against a man who apparently had had little if any experience on the road. Ought not a brakeman to be tested a considerable time in less important train-work, or in work under a monitor, before being put in charge of a flag that is the only protection of 17 lives? In collision No. 3 a fireman had had only nine months' experience; and a fireman requires months to learn about flagging and switchtending where a brakeman would have the opportunity to learn in weeks. This fireman had been on duty 20 hours. While it is usually difficult to show that weariness is the cause of negligence in a given case, unless the negligent one admits it, an experienced man can undoubtedly stand the strain of overwork with less danger than one who lacks experience. Finally, in collision No. 7 the conductor, the engineman, the flagman and the fireman were all inexperienced. We can hardly assume it to be accidental that the bulletins so freguently report errors by men who lack experience; rather we should assume that the direct connection between the casualty record and the scarcity of experienced men for the train service which is believed to exist is here clearly illustrated. It is a safe assumption even if a wrong one; we are following the time-honored rule to take the safe side. The opposite assumption—that our oldest and best men make the worst mistakes—is good for nothing but to put us to sleep.

Electric Retrospect and Forecast.

A few weeks ago President Mellen, of the New York, New Haven & Hartford, in an authorized interview, strongly implied, if, indeed, he did not assert, that a few years more would probably find electric trains in operation on the main stem of his system. The foreword is of some special and personal emphasis as spoken by the official head of a system which already owns some 300 miles of track operated by electricity, and a considerable part of that mileage former steam road; which has almost one-half of its total revenue derived from passenger traffic; and which has gone far beyond any other steam railroads of the country in the boldness and diversity of electrical ventures that now represent investments of between $15,000,000 and $20,000,000. Such an official prophecy, combined with the physical and traffic conditions of one of the great railroad systems of the country, may well justify a speculative excursion into the future of steam and electricity. But the same speculation, before it advances, may for a moment reverse itself into the past tense and ask what would have come to pass if the managers of the steam lines could have foreseen twenty years ago the results which were to come a few years later when horsepower on street railways was to be superseded by the trolley. The answer is alphabetical in its simplicity. A new figure of speech is needed to describe the speed with which the steam corporations would have bought up every horse-railway system along their lines. Let alone future losses from parallel competition if the street railways were not bought up, the increased investment value would have more than sanctioned the purchase. If the future events had then actually been foreseen by the steam corporations—in other words, if they had forestalled the outside capitalists who, with quicker vision, saw the possibilities of the new motive power—then the present status of the street railway systems would undoubtedly have been far different from what it actually is. Extension would have come slowly; few parallels would have been built; and there would have been much less of the familiar over-capitalization. But, under unified control, there would also have been closer relations of the steam and electric roads and much earlier study of the problem how to get them physically together. However, all this was not to be. The steam corporations missed the opportunity which men, who at that time were called rash, seized; and now a steam company, if, like the New Haven, it buys up a street railway system, must pay a great price, and usually a considerable part of that price for water. And, as a secondary consequence, the investigation of co-operative service for the two systems has been belated.

Let us next turn speculation to the future and assume as a hypothesis, certainly not so bold as it was a few years ago, that the main trunk line of a steam railroad system, or, at least, that part of it which is a heavy passenger carrier, is electrified. The examination of the relations of such a line to a street railroad system becomes an interesting and suggestive study. Let us imagine, as is generally the case now and would surely be the case then, that in a city of say 100,000 inhabitants, several car lines belonging to one street railway system converge at the station of the electrified road, each one of these lines becoming, in effect, a passenger branch line of a road operated by the same power. The main gap which separates the two systems is bridged, and the question of physical union is merely one of minor mechanical adaptation. The electrified trunk line has come into close relations with a series of branch lines which are its natural allies, and with a station at every street corner. Now the persistent law of railroad consolidation has shown us that in the past the steam corporation has bought up or leased its most valuable allied branches. A trunk line with many short feeders supplying good business and not under its control is, in fact, almost a railroad anomaly. The force of the analogy, as supplied to the relations of the electrified steam road with the street railway is obvious, and the final merger a logical conclusion. But the analogy does not end here. Unlike the steam branch line—usually a feeder and nothing else—the street railway would have a double relation to the electrified stem. As a city line it would be a feeder; as a suburban line, with branches to other municipalities, it would be, as now, very often a competitor. And the insistent rule of merger bears at least as strongly on the competing as on the allied line. In the hypothesis the street railway system thus would become the object of double forces both tending toward consolidation.

Pushing the fancy still further—and how many fancies of the past have fruited into the realities of the present—multiplied problems open up to the speculative eye. If the steam railroad and the street railway are to merge under the same motive power, what are the possibilities of interchanged traffic, cars "bunched," entrained and redistributed? What will be the limits as to length of run in the new and composite service? What the size and form of the car for the double operation? What its economies and risks? How will it affect freight service and distribution, and how about the law of the additional servitude as applied to the freight car or the big passenger car on the city street? And what are the changes in legislation which await the new hybrid? But it is time for the hypothesis to turn on brakes and shut off steam.

Quite outside of any realm of hypothesis and fancy, certain facts stand positive and fixed. We know, for certain, that electricity, both in this country and abroad, is reaching out to the steam road. We may not be able to fix its scope and limitations, but we can descry along broad lines the direction of its progress. Geographically in this country it will make its greatest as well as its earliest advance in the regions of the largest ratio of steam passenger traffic like New England and, more notably, southern New England, including Boston. In a more localized and specific sense it will first embrace the steam lines which (1) have already in some degree adopted it either by partial electrification of the steam road or by purchase of trolley systems, or (2) have already suffered keenly from electric rivalry like that outreaching from certain cities of the middle west and the northwest. These three pointers—heavy passenger traffic (especially local), existing ownership of electrics and existing competition—indicate the wider highways of the onward movement of electricity. The by-paths are still in the dusk, but the dusk of the dawn, not of the evening.

A Court-Made Amendment to the Coupler Law.

The decision of the United States Circuit Court on the Safety Appliance Law, in the case of Voelker against the Chicago, Milwaukee & St. Paul, which was reported in the *Railroad Gazette* of Oct. 24, 1902, p. 819, was appealed by the railroad company to the United States Cir-

cuit Court of Appeals; and that court, in a decision (No. 1,842) handed down March 26, has now reversed the judgment, in favor of Voelker, and has ordered a new trial. The present decision is by Circuit Judges Sanborn, Thayer and Van Devanter, and the reversal is based principally on the ground that Voelker, when catching cars which, in switching, were kicked into a side track, was bound to look out for himself; he had not the right to go between cars to adjust an imperfect coupler, depending upon a notice from the conductor or from the head end of the train, that other cars were to come back against those at which he was at work.

The decision, however, is more far-reaching than this, as it discusses the Safety Appliance Law, as related to couplers, in minute detail; and it appears to hold that when a brakeman opens the knuckle of a vertical plane coupler, preparatory to coupling, he is performing a part of the act of coupling, which is contemplated by the law; and therefore is, during that act, protected by the clause of the law which says that the coupler must be of such character that men need not go between the cars. The statute applies this clause to uncoupling; but Judge Van Devanter, who prepared the opinion, inserts a comma after the word "uncoupled," and thus makes the clause apply both to coupling and uncoupling. The justification for adding this comma he seems to find in the statute of the State of Iowa, on the same subject, which applies both to coupling and uncoupling; the purpose of that statute is held to be identical with that of the Federal statute.

The reader will naturally conclude that this interpretation of the Federal statute so modifies it as to make it require all couplers to have an automatic knuckle-opener; but the court does not go quite so far as that; the decision seems to hold that when a man stands (or walks) in the middle of the space between the rails of the track, where he can manipulate the coupler with both hands, he is "going between the cars" as contemplated by the statute; but that when he stands outside of the rail, or perhaps with one foot inside the rail, and holds on to the corner of the car with his left hand, while reaching to grasp the knuckle with his right hand, he is not "going between the cars." The following extracts from the decision will show the learned judge's reasoning.

The evidence relating to the condition of the coupler on the coal car was conflicting, but substantial evidence was produced by plaintiff to the effect that it was equipped with a coupler known as "Hein No. 1" which originally, and when in good condition, could be prepared for coupling, and would couple automatically by impact, without the necessity of anyone going between the ends of the cars, in the sense of putting the body entirely between them, but that at the time of the injury to Voelker this coupler had become so defective and inoperative that when the knuckle thereof was closed it was necessary for some one to go completely between the cars to open it and thereby prepare the coupler for the impact.

The second section of the safety appliance act of Congress of March 2, 1893, declares that it shall be unlawful . . . to haul or permit to be hauled or used any car used in moving interstate traffic not equipped with couplers coupling automatically by impact, and which can be uncoupled without the necessity of men going between the ends of the cars. A statute of Iowa declares that no company . . . using or leasing cars, shall have upon such railroad any car that is not equipped with automatic couplers so constructed as to enable any person to couple or uncouple them without going between them.

While there is some difference in the words by which these statutes describe the type of coupler with which each requires cars coming within its operation to be equipped, we think both apply the test, of whether the person operating the coupler is required to go between the ends of the cars to the act of coupling as well as to that of uncoupling. The risks and dangers which attended the old link and pin system, when couplings and uncouplings were effected by going between the cars, were such a menace to the lives and limbs of those employed in that branch of the railroad service, and these risks and dangers inhered so largely in the act of going between the cars, whether in the act of coupling or uncoupling, that there can be no doubt of the purpose of the Congressional enactment as well as of that of the State to obviate and prevent this act of exposure, which the invention and use of automatic couplers had demonstrated to be wholly, or at least largely, unnecessary. . . . If there be uncertainty in the Congressional act it is obviated by merely inserting a comma after the word "uncoupled" in that portion of the act which calls for *"couplers coupling automatically by impact, and which can be uncoupled without the necessity of men going between the ends of the cars."* The concluding phrase then literally applies to both the coupling and uncoupling. Punctuation is a minor and not a controlling element in interpretation, and courts will disregard the punctuation of a statute or repunctuate it, if need be, to give effect to what otherwise appears to be its purpose and true meaning. Obviously the purpose of this statute is the protection of the lives and limbs of men, and such statutes, when the words fairly permit, are so construed as to prevent the mischief and advance the remedy. The mischief to be prevented rested quite as much in the act of coupling as in the act of uncoupling.

The contention that the preparation of the coupler for the impact is distinct from the act of coupling is a mistaken attempt to separate a part of an act from the whole. The preparation of the coupler and the impact are not isolated acts, but connected and indispensable parts of the larger act which is regulated by these statutes and the performance of which is intended to be relieved of unnecessary risk and danger. There is no doubt under the evidence but that this "Hein No. 1" coupler when in reasonably good condition is operated in this manner: The switchman, by depressing with one hand a lever at the corner of the car, lifts the pin from the socket in the coupler, and leaning toward the coupler readily draws the knuckle open with the other hand, an act which is performed in a brief space of time, with slight exertion, and without placing the body completely between the ends of the cars. Plaintiff's petition complains, not of the type of coupler with which this car was equipped, but that defendant negligently permitted it to become and remain so defective and out of repair that it could not be operated in the usual manner; that the pin could not be lifted by means of the lever, and that it was necessary "to go between the cars, insert the hand in the coupler, push the tumbler away from the frame, and then raise the tumbler and pull the knuckle open." For the present purposes it will be assumed—a decision upon the question being unnecessary—that this coupler, if in reasonably good condition satisfied both statutes. But in this case the lever would not lift the pin from the socket; the knuckle could not be drawn open by leaning toward the coupler and using one hand, but to open it required the presence between the ends of the cars, and between the drawbars, of the entire body of the person attempting it, and also the use of both hands, considerable strength, and more than the usual time, all of which greatly increased the risk and added to the danger of the undertaking.

President Mellen on Labor Unions.

On April 28, President Mellen, of the New York, New Haven & Hartford, addressed the Workingmen's Free Reading Room Association at Hartford, Conn., on the relations of the workingman to his employer. It is especially noteworthy that Mr. Mellen's views as to the uses and misuses of unionism should have been expressed, with his customary frankness, before hearers who might naturally be disposed to take issue with him. Like reform campaign speeches, remarks criticising labor union methods generally persuade an audience already convinced, and their chief effect is to land another cargo of coal at Newcastle. But Mr. Mellen was talking to workingmen, and he was talking to them while he had a strike on his hands. The following is an extract from his address:

"This is the age of the workingman. Let him with moderation, with conservatism, show his ability to assume responsibility and there is no bounds set to his attainments. The captains of industry of the future are among you struggling at days' wages for recognition. Men of affairs are looking earnestly towards you, for there is a great dearth of men for the higher positions the modern industrial combinations are creating. But they are not looking for firebrands, for trouble breeders, for talkers, but rather for the quiet man who works while others do the talking. To those of you who belong to unions I wish to say I believe they have accomplished much good but they are, nevertheless, not an unmixed blessing to the laboring man. They tend to the discouragement of individual effort and reduce man to a part of a machine. They are a good thing for the drone, the inefficient man, for the walking delegate and the officers, but are unnecessary for the man who has the courage to carve his own way in the world. Divested of all clap-trap, the union is simply a means of averaging wages and an employer views it as such. It is a device for making those who are willing to work care for those who want to soldier."

President Mellen said he believed that unions as a condition had come to stay and that he had no prejudice against properly conducted ones, and it was his wish that his own men generally would join them. He would not run a union plant as such, but he would wish to have in the unions the conservative influence of many of the good men who are out to counteract the floater, the anarchist, the man who has nothing at stake, who works with his mouth more than his hands.

"The trouble with unionism is its intolerance. To succeed in this world one must bear and forbear. The same spirit of intolerance that fills the union man towards the non-union is what history shows us to have prevailed ages ago in religion and other ways. It is through the elimination of the feeling that physical force is necessary to the accomplishment of results that real progress is made. You cannot force things your way but you may direct them."

Speaking of the strike on the New Haven road, he continued:

"I would like to pay the men of our company better wages and allow them greater privileges than my neighbors, but if I do it some one else will take my place who will bring about an equitable comparison. If our employees could only know the struggle it has been for the past few months to keep so many of them at work at all they would feel that our officials have had their interests in mind much more than they are willing to admit."

The Atchison, Topeka & Santa Fe has appointed E. O. Faulkner manager of the ties and timber department, with headquarters at Topeka, Kan. The managers of all tie and timber preservation plants will report to him, as will officers concerned with the maintenance of track and of bridges and buildings with regard to any matters connected with the greater durability or prolongation of services of ties and timber, and he has authority to call for detailed reports from them. Part of Mr. Faulkner's duties will be to maintain a record showing the location of all treated and untreated ties inserted in the track and of timber inserted in bridge structures each year, together with the dates of removal of such ties and timber on account of decay, or from other causes. The position thus created gives considerably more authority to the manager of the timber department than has heretofore been accorded, either on the Atchison or elsewhere. A tie and timber manager, with facilities and authority for keeping complete records should have an increasing value to his railroad, year by year. So much of the expert investigation work which has been carried on in timber and tie preservation has been *ex parte;* devoted wholly, or in large part, to the specific kind of treatment under experiment, that there is great need for just such an officer, who will work for definite results in increasing the length of life of the timber used on his road at minimum cost, and will have no special affiliation with any one process. In place of records giving the career of ties which have undergone a particular treatment on 10 or 12 different railroads, a comparative history can be obtained of the results from a number of processes closely observed on a single railroad, and such a document should be of great value, not only to the Atchison, but to the study of timber preservation in general.

NEW PUBLICATIONS.

The Theory of Advertising. By Walter Dill Scott, Ph. D. Director of the Psychological Laboratory of Northwestern University. Boston: Small, Maynard & Co. Size, 5½ in. x 8¼ in.; 233 pages and index.

The psychological laboratory is getting to be a factor in practical life, in spite of the mild sneers of those who look upon its work as a lot of refinements which are too fanciful for everyday work. Dr. Scripture, of Yale University, has given us a practical improvement in the art of detecting color-blindness and has offered to measure enginemen's mental abilities so that we can tell which ones are least likely to get confused in an emergency; and now Professor Scott, in this book, systematizes such things as the art of making time-tables legible and of designing signals so that they will be easily seen. The theory of advertising may be paraphrased as the science of attracting attention, and that is a thing in which all of us are interested. Signal engineers and division superintendents who discuss interminably the relative merits of the semaphore and the disk, or of high and low signals would be enabled to bring their arguments to a head by reading Professor Scott's chapters on perception and apperception and illusions. The book is entertaining throughout. It tells the reader many things that he knew before, but even in these it is profitable reading, for it formulates ideas which before were so vague as to be useless. The art of advertising consists largely or wholly in attracting and holding men's attention, and our need of the knowledge of it is not by any means measured by our use of the printed page. The examples of good and bad advertisements cited by Professor Scott are nearly all taken from the magazines, but his theories and observations apply as well to technical newspaper advertising and are full of suggestions for those who would secure buyers for boilers or bridges, oils or wrenches, paint or plush. One of his best examples of a good advertisement is a modest display cut issued by the Chicago, Burlington & Quincy passenger department. The cover of the book itself affords a good example of one of the advertiser's arts, in that it is striking enough to be distinctive and to fix its image in the observer's memory, while at the same time it is not in the least bizarre. It is a pale and rather dull green cloth with a calf back and a cream and gold side stamp.

TRADE CATALOGUES.

The Strauss Trunnion Bascule Bridge, Roemheld & Gallery, Licensees, Chicago, is described in a pamphlet just issued. The Strauss design claims especial merit in its arrangement which enables it to keep tail-end, counterweight, etc., clear of the water; permits the concentration of the entire counterweight at the extreme point of the tail-end, increasing the effectiveness of the latter and thereby compensating for an actual shortening thereof; and permitting the placing of this counterweight either above or below the roadway and to the front or rear of the connecting pin, allowing in most cases the use of concrete for the weight. Other important points claimed are the use of straight structural work, simple operating machinery, the placing of the break in the floor ahead of the trunnion so that no live load can tend to open the moving leaf, ability to provide complete lateral bracing for the latter, and simplicity of substructure. Drawings are shown of a competitive design accepted by a western railroad. It has one moving leaf 150 ft. center of end bearing to center of trunnion, trusses 30 ft. deep and 20 ft. c. to c., tail-end 27 ft. long and fixed end 30 ft. 6 in. center of trunnion to end post. Further detailed description of the design is given, and an appendix contains drawings of various types for different purposes.

Fisk & Robinson, 35 Cedar street, New York, issue an interesting industrial map of the United States show-

ing the advantage the Gulf ports will have in shipments to the Pacific when the Panama canal is completed. A shaded line starting in the southern corner of Arizona and New Mexico and running northeast to the junction of North Dakota and South Dakota and then southeast to Savannah, shows what may be called the theoretical neutral zone for shipments to the nearest seaports of the competing seaboards. The location of this zone was determined by calculation of average ton mile revenues as obtained from the report of the Interstate Commerce Commission and applied to bee line distances between the nearest ports of the competing seaboards on the Atlantic, Gulf and Pacific. All the territory south of this shaded area is calculated to be tributary to the Gulf ports in economy of transportation.

The Sherwin-Williams Paint Company, Cleveland, Ohio, has just published a railroad catalogue in book form containing a set of color samples of such paint material as is especially adapted for use on railroads. The different lines of paint are classified according to the equipment for which each is primarily intended, and a table of contents at the beginning greatly facilitates the reference to the types of equipment. Under each head a brief summary is printed of the principal qualities of the paint and the uses for which it is intended. Pages 73 to 76 are devoted exclusively to suggestions for the proper method of painting passenger coaches. These suggestions are arranged in such form that it will be easy to use them in specifications when orders are placed for new cars or for repainting. The catalogue also contains at the end some general information and lists.

The Chicago & North Western has issued a pamphlet describing the through sleeping car service which it has recently established over its own and the Minneapolis, St. Paul & Sault Ste. Marie Co.'s lines between Chicago Milwaukee and the Soo. The pamphlet contains a brief history of the growth of the shipping industry on Lake Superior since the Cartier expedition to America in 1535 and is fully illustrated with half-tones of the Sault Ste. Marie canal and other interesting features. The passenger department of the Chicago & North Western has issued a folder compiling the fish and game laws of Illinois, Michigan, Iowa, Nebraska, Wisconsin, Minnesota, South Dakota, North Dakota and Wyoming. Copies may be obtained from W. B. Kniskern, Passenger Traffic Manager, Chicago.

The Laidlaw-Dunn-Gordon Company, 114 Liberty street, New York, issues Bulletin L 511 describing its various kinds of low-service compressors designed for pressure of 30 lbs. and under. These compressors are built either with open suction for supplying air at low pressure or with closed suction for handling carbonic acid and other gases. They are supplied with semi-rotary Corliss inlet valves and outlet valves of the poppet type. The bulletin is fully illustrated with half-tones of the Meyer-Corliss steam-valve gears and contains complete tables of dimensions of the various machines.

The S. Obermayer Company, of Cincinnati, Chicago and Pittsburg, has issued a cloth bound catalogue of 370 pages, 6 x 9, known as General Catalogue No. 40, and descriptive of all kinds of foundry equipment. The catalogue is carefully indexed and lists some 1,200 articles. It also contains an illustrated history of the Obermayer foundry supply house, and discusses at greater or less length a large number of implements and processes. In the back of the catalogue are 10 pages of useful statistical information relative to foundry work, and there is also a telegraph code.

Catalogue No. 161 of the American Blower Company, Detroit, Mich., is devoted to A B C disc ventilating fans. The general construction and the action of the fan are first explained, after which different styles are presented, dimensions, price lists and illustrations being given for each, and engine, motor and belt-driven fans being included. Some pointers about ordering and installing fans are given, also a table of capacities, speeds and horsepowers of A B C disc ventilating fans, and other tables of useful information.

Broderick & Bascom Rope Co., St. Louis, has issued a complete and convenient vest-pocket map of the World's Fair. In addition to a 8 x 12 color map of the grounds, with index to locations, important information to visitors is included, giving facts about the exposition, hotels, transportation facilities and a small map of the city. Copies will be mailed upon receipt of 2 cents for postage.

The advertising department of the *Union Pacific* has just issued a very complete guide to the World's Fair and to the City of St. Louis. In addition to a detailed description of each principal building of the fair, fully illustrated, there is a history of the Union Pacific road, together with an account of the part it played in the development of the territory included in the Louisiana Purchase. A bird's-eye view of the Fair is shown and an outline is given of the principal features of the Exposition.

The Erie Railroad, Industrial Department, of which Luis Jackson is Commissioner, has recently issued a little folder containing a map of its numerous lines adjacent to New York; also a map in colors showing at a glance the location of the vast deposits of coal, oil and natural gas in the territory traversed by the road. The pamphlet also shows the important business centers and has a short account of the physical resources and advantages along the route.

The Veeder Manufacturing Company, Hartford, Conn., sends out a leaflet of its Form C tachometer. This instrument, which indicates the revolutions per minute of dynamos, motors, etc., is made without springs or pivots and contains only one moving part, viz., the paddle wheel in the centrifugal pump. It has a 12 in. scale which may be fixed for readings from 500 to 2,500 revolutions per minute.

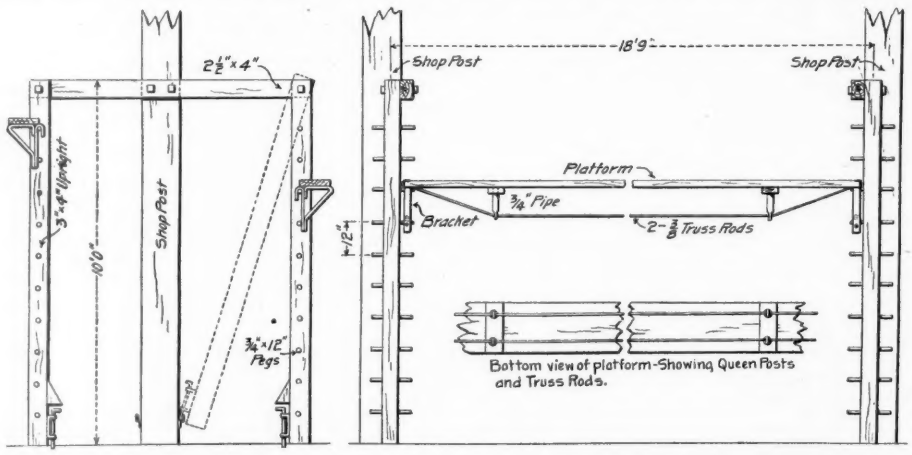
The Joseph Dixon Crucible Company, Jersey City, N. J., has issued a pamphlet telling the uses of its pipe joint compound; chiefly, as its name implies, as a tight pipe joint and for preventing corrosion of metals, machines, tools, etc. A list of the sizes in which it is put up is also given, with a few illustrations.

Keuffel & Esser Company, New York, has issued a circular illustrating and describing a practical adding machine which will accurately add any number of columns or figures from one to three at a time. The machine measures 5 x 7⅜ in., weighs 26 ounces, and consists of two dials which revolve against each other.

An Adjustable Scaffold for a Paint Shop.

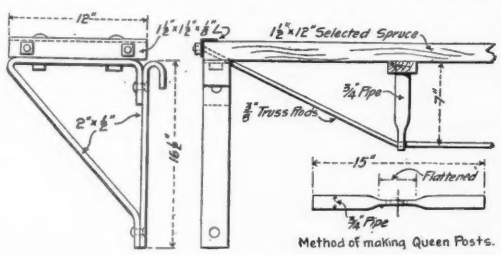
The general design and details of a simple and effective scaffolding used in the paint shops of the Central Railroad of New Jersey at Elizabethport are shown in the accompanying illustrations.

The cross-bars or supporting beams are made of 2½-in. x 4-in. yellow pine bolted to the shop posts about 10 ft. from the floor. The cross-bars extend out about four feet on each side of the posts and 3-in. x 4-in. uprights are pivoted to their ends. The uprights are just long enough so that when in a perpendicular position their lower ends rest upon the floor. When in use each upright is prevented from moving by the bolt at the lower end which locks into the concrete floor. When not in use, each upright is swung back and bolted to the shop posts, as shown by the dotted lines. This gives a clear passageway for the workmen. In each one of the uprights ten ¾-in. round iron pegs are placed; these are spaced 12-in. apart, and extend out about 4½-in. on each side.



An Adjustable Paint Shop Scaffold, Elizabethport Shops—Central Railroad of New Jersey.

The plank or working platform is made of 1½-in. x 12-in. selected spruce, and is trussed by two ⅞-in. truss rods. Each truss rod passes through two queen posts. The truss rods are pulled up just tight enough to give the platform a slight camber. The ends of the platform are protected by angle irons which act as bearings for the bracket and truss rod nuts. The queen posts are made of ¾-in. iron pipe flattened in the middle, and sheared and punched as shown in the detail sketch. Holes drilled in the wooden crossties, which are secured to the platform by screws, act as sockets for the queen posts. A hooked bracket shown in the detailed illustration is bolted to each end of the platform. To hang the platform, the hooks are dropped over corresponding pegs in the uprights. The platform is kept from turning by means of the lower ends of each bracket bearing against the next lower peg. This arrangement makes a safe and strong support, and allows the scaffold to be readily adjusted to any height. The pegs in the uprights can be used as ladders. This system was designed by R. W. Burnett, General Foreman of the car shops.



Details of Paint Shop Scaffold.

The Modern Steam Locomotive.*

(*Concluded from page 323.*)

With progress toward higher ideals in locomotive design, there has been a steady increase in steam-pressure. During the past 20 years pressure has gone up from 130 pounds, in 1880, to above 200 pounds in 1900, and this increase is responsible for many changes in the details of locomotives. Boilers have, of course, become heavier, and where power has not increased, cylinders have become smaller and lighter. In other words, by virtue of the higher steam pressure, the dimensions of the engines of the locomotive have not increased in proportion to their increase in power. The higher steam pressures are chiefly responsible for a very general adoption of the piston valve. The extent to which they have affected the economy of the engines cannot be definitely defined. From a purely thermodynamic point of view, each increment in pressure should bring its return in increased economy, but as the scale of pressure ascends, the economy increment diminishes, while radiation and leakage losses increase. The range of pressure now common in locomotive service is so high as compared with that employed in other types of engines, as to fairly raise the question as to whether economical limits have not already been reached or even exceeded. The practical question can best be defined somewhat as follows: An opportunity is presented whereby the boiler of a proposed locomotive may be 5,000 lbs. heavier than that of an existing class. Should this additional weight be utilized in making a stronger boiler that a higher pressure may be carried, or should it be utilized in making a larger boiler that the rate of evaporation may be reduced? Either course should result in increased economy in operation, but which course will prove most economical and where the limits lie, cannot be stated. It will, I am sure, be of interest if I add that the whole question of locomotive performance as affected by boiler pressure and extent of heating surface, is one which is now being carefully studied in connection with the locomotive testing plant of Purdue University under the patronage of the Carnegie Institution.

With steam pressure upon simple engines approaching 200 lbs., the advisability of using compound cylinders began to be considered. In the early nineties the compound locomotive became a subject of much interest in this country. The advantage of compounds as an abstract proposition was not doubted. The problem was to build up a mechanism which, while meeting the requirement of correct theory, would at the same time be sufficiently strong and simple to justify its use under the severe conditions of locomotive service. At first, all efforts were directed to the development of a two-cylinder type, the impression being that to succeed, a compound must have no more parts than a simple engine. But as time passed and as all locomotives grew in size, the problem of the two-cylinder compound became one of increasing difficulty, until now, the clearance in tunnels and past station platforms is on many roads insufficient to allow passage of the large low-pressure cylinder. Meanwhile, the Vauclain four-cylinder type has come into extensive use, and four-cylinder tandem-compounds are being introduced until now the tendency is strongly toward a four-cylinder type. In all this there has necessarily been much experimentation, and experimentation sometimes leads to troubles and disappointments as well as to promise and success. In some cases the compound locomotive has proven expensive to maintain; in others, ill adapted to the service expected of it. Compounds should not often be used under conditions requiring frequent starting and stopping, or when changes in the grade of the track are such as to require frequent changes in the conditions of running. It is on the long, steady pulls that they will show their largest gains over the efficiency of the simple engine. Another fact of great importance in any discussion of the economic performance of the compound as compared with the simple, and yet one which is rarely taken into account, is that which concerns the proportion of the total coal used, which is burned while the engine is advancing its train over the

*A paper read by Prof. W. F. M. Goss before the Am. Soc. M. E. April 26, and illustrated with lantern slides.

road. In the freight service of the average road not more than 80 per cent. of the total coal burned is effective in the generation of steam for the cylinder of the engine. The other 20 per cent. represents fuel used in firing up, in keeping the engine warm while standing, or remains in the fire-box at the conclusion of the run. Obviously, no change in cylinder arrangement can reduce the amount of coal thus consumed. A compound locomotive, therefore, which upon test shows a fuel saving of 10 per cent. over that required by a simple engine will, when put into regular freight service, have a chance to save but 10 per cent. of 80 per cent. of the amount of coal which the simple engine uses. These are facts which should be fairly faced in any discussion of the compound problem. They in no wise discredit the usefulness of compounds, which without doubt are to have a large part in the future service upon American roads.

Having now seen that American practice in compounding is committed to the four-cylinder type, it will be of interest to consider a design which theoretically at least must be regarded as the highest development of that type. I refer to the design of the de Glehn balanced compound which was first brought out in 1886, and which for several years has been the standard for all new passenger power on several of the larger roads of France. An examination of the drawings suggests great complication, but I shall attempt to show that the design embraces very little that is objectionable, and that it presents certain advantages which no other design has compassed. I can perhaps forestall criticism by saying that many American engineers, who have had an opportunity to observe its action, have expressed their admiration with enthusiasm. The fact, also, that the Pennsylvania Railroad is at great cost importing from France an engine of this type for experimental work on its lines; that the American Locomotive Company is building a large engine upon this general design, and that both of these will be tested upon the locomotive testing plant of the Pennsylvania Railroad Company at St. Louis this summer, should give additional interest to the de Glehn balanced compound.

In the de Glehn design, the two low-pressure cylinders of a four-cylinder compound are placed side by side between the frames, and connect with inside-cranks, which are set quartering on the forward driving-axle. The details of these cylinders and surrounding parts are similar in every respect to those of all inside-connected engines. Thus placed, the low-pressure cylinders are well protected from radiation, and they connect with exhaust passages, which are both short and direct. The high-pressure cylinders are placed outside the frame and connect with outside-cranks in the wheels of the second driving-axle. These cylinders are not in the same cross-section with the low-pressure cylinders, but are carried back on the frames a distance which is substantially equal to the spacing of the driving-axles, so that the main rod of the outside cylinder connecting with the second driving-axle is no longer than the main-rod of the inside cylinder connecting with the first driving-axle. The side frames between the high-pressure cylinders are strengthened in substantial cross-bracing in the form of a casting, not shown in the sketch, which, so far as the frames are concerned, serves the purpose of a false saddle at this point.

The two or more pairs of driving wheels are connected by coupling rods, the several cranks being so arranged that the pins for the coupling rods in the front drivers are set diametrically opposite the inside cranks of the axles carried by these wheels. When one of the outside pistons moves forward, an inside piston moves backward, the reciprocating parts of each high-pressure cylinder being balanced by the reciprocating parts of its neighboring low-pressure cylinder. If, under these conditions, each wheel is perfectly balanced for its revolving parts, and if the reciprocating parts of the high-pressure engine have the same weight with those of the low-pressure engine, the machine as a whole will be balanced, both horizontally and vertically. So far as the action upon the track is concerned the balance will be practically perfect.

It will be seen that the machinery of these engines, as compared with that of an American two-cylinder engine, involves nearly double the number of parts. Thus, the French engine may have the same number of axles and wheels, but all other machine parts such as pistons, cross-heads, main rods, valve motions and valves are in duplicate. Each cylinder is treated as a complete unit having its individual cross-head and its individual main-rod. There are four sets of cross-heads instead of two, as in American practice, and four main-rods instead of two. But these apparent disadvantages are more than compensated by the increased lightness of the parts involved, and by the possibility of a higher character of design. In American practice, the two main-rods of a modern engine must each be designed to transmit from 800 to 1,000 h.p. That this may be accomplished rods have become enormously heavy and crank-pins have grown to be as large as axles were 10 years ago. Moreover, the forces to be transmitted often exceed the ability of the fixed portions of the machine to withstand properly, hence, parts strain, journals and brasses fit badly, and hot pins and boxes result. An American locomotive, if designed after the de Glehn type, would have four rods, each transmitting from 400 to 500 h.p., and the rods themselves would be light. The pins, while comparatively small, would afford liberal bearing surface without exceeding a convenient limit in size, and concentrated stresses upon all fixed parts would be reduced. In such a case, who shall say that the duplication of parts when offset by such obvious advantages, increases the chances of failure? Is it not conceivable that under the conditions which have been described a large number of parts may even involve fewer chances of failure?

Another objection often regarded as insurmountable by the American designer, is that the inside cylinders necessarily connect inside of the frames, and, hence, a crank-axle is necessary. When this objection is analyzed, it is found to be based in part upon the extra cost of a crank-axle, and in part upon experiences of long ago. Early American engines which were fitted with crank-axles, were very flexible and were frequently run over exceedingly rough track. The record shows that in such engines there were numerous failures of axles. We, therefore, said, and for years have continued to say, that we will not use the crank-axle. Our modern engine, however, is less flexible than the earlier one, and is less subject to strains through inequalities in the track. Our advantages in this respect are at least equal to those of other countries. If England and France can run crank-axles, why may we not do the same? The fact that these countries do use them, and meet with few failures, would indicate that the American objection is largely historic.

But the French compound presents another side to the axle question, too important to be overlooked. The problem of transmitting 1,500 or 2,000 h.p. through a single locomotive axle has in American practice led to the adoption of axles of very large diameter. In spite of this fact, axle failures on heavy engines are by no means unknown. With steam pressures and cylinder diameter still tending upwards, where is there sign of relief? Here, again, we can well afford to look with favor upon the French compound, for by its design the total power of the engine, instead of being transmitted through a single axle, as in American practice, is divided between two. The inside cylinders connect with the forward axle, and the outside cylinders with the rear axle. By the adoption of the de Glehn type, no single axle of our modern engines would be called upon to transmit as much as 1,000 h.p., and present diameters could be materially reduced, and at the same time allow a wider margin of safety. The balanced-compound, therefore, instead of introducing axle troubles, may reasonably be expected to lead to a betterment in present conditions. The advantages of the French type may be summarized as follows: It solves completely the difficult problem of balancing drive-wheels, it constitutes a satisfactory system of compound cylinders, it avoids the concentration stresses in frames, it divides the total work of the cylinders between two axles instead of concentrating it in one, and the dimensions of the details of its machinery are such as will permit them to be well designed. The work of de Glehn has had a marked influence on locomotive design in many countries as is to be seen in the building of balanced compounds in Germany, England and in the United States as well as in France.

Quite recently a rival of the compound has appeared. While Americans have been rigidly orthodox in their application of principles, contenting themselves with such progress as may appear in the better design of machine parts and in the choice of better materials from which to construct them, and while the French have been busying themselves with the problems of their balanced compounds, German designers under the leadership of Herr Wilhelm Schmidt have been experimenting with superheated steam. Encouraged by his success in stationary practice, Herr Schmidt has extended the application of his system to locomotives, with the result that here are now four or five locomotives of the Schmidt type running and still others building. These engines are in service on the State Railroads of Prussia, and it is claimed that their performance is 25 per cent. better than that of similar engines using saturated steam. The Schmidt system involves no material changes in the exterior form of the locomotive boiler, but the tubing is modified and the smoke-box design is so changed as to accommodate the superheater which is located therein. A flue 10 or 12 in. in diameter extends from fire-box to smoke-box along the lower portion of the barrel of the boiler. This displaces from 20 to 30 of the small tubes which would otherwise have its place. Its purpose is to deliver to the smoke-box a considerable volume of furnace gases at a high temperature, in the accomplishment of which purpose the tube serves well. To give room for the superheater, the diameter of the smoke-box shell is somewhat greater than the barrel of the boiler.

The pipes of the superheater occupy a space lying between the outside shell of the smoke-box and the interior partition sheet, a cross-section of this space having the shape of a horse-shoe, the toe-calk of which may be assumed to be at the bottom of the boiler. The construction is such that the gases discharged from the small tubes are free to pass directly up the stack, having thus no contact with the superheater, all as in an engine of usual construction. The gases discharged from the large flue, however, pass into the space occupied by the superheater at a point near the bottom, and sweeping around on either side, are discharged into the smoke-box space on either side at points near the base of the stack. The length of this annular space in the direction of the axis of the boiler is almost equal to the diameter of the boiler. It is filled with the pipes of the superheater. The pipes start from a header near the stack on one side, and pass around to a similar header near the other side, the extent of the superheating surface thus provided equaling 25 per cent. of the direct heating surface of the boiler. The headers are so arranged that steam passing the throttle of the engine goes to one of the headers, thence by one-half of the whole number of pipes to the opposite header, thence by the remaining pipes back to the first header, from which it is conveyed to the cylinders. In this passage and re-passage of the pipes, the temperature of the steam is raised to 500 deg. and 600 deg. F., which is from 125 deg. to 225 deg. above the temperature of the saturated steam at usual boiler pressures. This steam is conveyed directly to the cylinders. Published reports of the performance of the Schmidt locomotive show a gain in efficiency which is generally stated to be equal to 25 per cent., and the absence of all trouble in respect to cylinders or superheaters. These statements if true are full of significance.

Examining the design more in detail, we shall find in the Schmidt locomotive a condition more favorable to the use of a superheater than any which have ever been tried in this country. The installations with which we have hitherto dealt have served in stationary or marine practice. The superheater of these plants has either been a separate boiler-like device in which no water was carried, or has been so combined with the boiler as to be always in close communication with its furnace. Under these conditions, when the engine throttle is closed, the circulation of steam within the tubes of the superheater ceases and the metal of the tubes, together with the entrapped steam within them, remain exposed to the undiminished intensity of the furnace action. In this manner, the tubes are often heated to a very high temperature, a result which when often repeated leads necessarily to a failure of the superheater. Again, when after an interval of inactivity, the engine is started, the steam which has been held back within the superheater until it has been raised to an enormously high temperature, passes on to the engine, oftentimes retaining enough of its heat to burn the lubrication and sometimes the rod packings. But all difficulties of this class which to a greater or lesser degree have appeared in the operation of every stationary plant using superheated steam, are doubtless avoided in the Schmidt locomotive. In this machine, as in other locomotives, the rate of combustion varies with the volume of steam used. When the throttle is open, the fire burns brightly; when it is closed, its activity is at once suppressed. When there is no steam passing within the tubes of the superheater, the gases circulating around the tubes are comparatively low in temperature, and when the conditions are so changed that the temperature of the gases becomes maximum, the volume of steam passing the tubes is greatest. Just as the draft responds to the varying demands which are made upon the boiler, so the volume of heat which is available for superheating varies with the quantity of steam which is to be superheated. The details of the design provide that when the blower is on, dampers are closed which prevent the circulation of gases in the superheater so that it is only when the throttle is open that the superheater does work. This would seem to make impossible any overheating of the superheater. In view of the highly favorable character of all these conditions, it is likely that it will be found easier to maintain a superheater of the Schmidt design on a locomotive than in connection with any other type of engine, and, moreover, that the superheating in locomotive service may be a pronounced success, while in other classes of service, its future is still problematical.

I would add that it is expected that two superheating locomotives of German manufacture are to be tested at St. Louis during the coming summer by the Pennsylvania Railroad Company.

American Railway Association.

The spring meeting of this association was held in New York City April 27th, 105 delegates being present. Mr. Stuyvesant Fish was elected President and Mr. C. G. Waldo, Second Vice-President, as reported in the *Railroad Gazette* last week. The convention adopted a rule governing the movement of trains against the current of traffic on double-track by means of block signals (without the use of time-table or train orders) and adopted a revised set of blanks submitted by the Car Service Committee for per diem reports. Amendments to per diem rules 3 and 10 were adopted, as follows:

Rule 3. A road shall have the right to demand the return of its car after it has been 20 days consecutively on any road. If the car is held by that road more than ten days after the date of such notice on the prescribed form, making 30 days in all, thereafter a penalty rate of 80 cents per day in addition to the per diem rate shall be paid by such road for the further use of that car.

Rule 10. The junction report for each day will be made to car owners on the prescribed form as promptly as possible after the receipt of the interchange report for that day.

The following resolution proposed by the committee was also adopted:

Resolved, That in formulating rules covering the transfer of carload freight, the Committee on Car Service be guided by the principle that the beneficiary road or roads should pay the cost of transfer.

For the purpose of ascertaining as nearly as possible the effect that the penalty rate has had upon the principal lines, the Committee obtained data from 42 roads,

operating 133,827 miles and owning 1,236,067 freight cars, showing that the results obtained, for the first year under which the per diem rules have been in effect, were:

Car days foreign cars on line, year ended June 30, 1903	124,168,287
Amount paid foreign roads for per diem and penalty, year ended June 30, 1903	$27,308,168
Average amount paid per day for freight cars, including penalty	$0.219

The Committee says:

"Study of these figures does not bear out the contention that the longer lines are seriously suffering under the penalty rate, as the differences which are shown are not in proportion to the length of line operated—the shortest and the longest lines in some cases showing exactly the same figures. It will be noticed that the average amount paid per day for freight cars, including penalty, is $0.219. In view of this statement, your Committee does not feel that it is prepared to recommend any change in the per diem and penalty rates at this time. It also considers it desirable, before such an important question shall be finally settled, that there shall be an opportunity of comparing the results of the second year's operation under the per diem rule with that of the first. The Committee has spent a great deal of time over the question of diversion, and especially the breaking of penalty by the diversion of cars to non-per diem roads, and by the disintegration of systems, but it is not prepared at this time to suggest any further measure on these cognate subjects. It is of the opinion, however, that a strict interpretation of the rules in the spirit in which they were conceived will be sufficient to check any improper attempts to break penalty."

Mr. L. Weissenbruch, Secretary General of the International Railway Congress, was present at the meeting and took part in the discussion in connection with the preparations for the first American meeting of the International Railway Congress, which is appointed to be held in Washington in May of next year. Mr. Weissenbruch made a brief address in which he said:

In the name of the Permanent Commission, I thank you most sincerely for the preparations which you are making for holding the seventh session of the International Railway Congress at Washington. It is now nearly 20 years ago that the first meeting was held, in 1885. How much work has been done since then! How many efforts have been made, in the first place to form, and subsequently to maintain and consolidate, between all the railroads of the world, that bond which depends only on mutual good will! Who would at present venture to dispute the usefulness of our publications and of our meetings, and the progress which has resulted from the investigations initiated by the Congress through the exchanges of ideas between men all of profound experience, acquired under the most varying conditions, and through the personal relations established between the delegates. True science and true art are always generous. The note of the railroad man as well as of the scientific man, and the artist who follows his art because he loves it, is that of not being moved by egotist motives. He is always wishing to communicate the knowledge he possesses to enlarge the general store and to advance the general progress.

Mr. Weissenbruch went on to give a clear and discriminating estimate of the influence of railroads on civilization, and a most appreciative comparison of European and American progress. In conclusion he said: The activity of your railroads does not cease to astonish, and I look forward to proclaiming, on my return, that the delegates of the next session of the Congress will see wonders here; whatever may be the amount of knowledge and of science which they have brought to bear on the work which has been entrusted to them, they have much to learn from you, particularly from the point of view of the fearlessness and freedom from prejudice which so often have led you to such grand results. But can it be said that they have nothing to offer to you? You are too experienced not to know that the experience of others is never to be despised. It is this very idea which predominated when the Railway Congress was founded. . . . I thank you most heartily for the very kind reception you have extended to me.

Foreign Railroad Notes.

The Austrian government has asked and obtained from the electrical works of the country plans and estimates for working its Alpine railroads. The great number of long tunnels on these roads, in which ventilation is imperfect if fuel is burned, make electric motive power desirable. The government is ascertaining the available water power for such electric plants.

In Austria the government imposed a railroad ticket tax, beginning with 1903, estimating that it would yield $3,006,000 per year. Actually it is said to have yielded $3,200,000 last year. Only a few years before fares had been greatly reduced, and the government gets back in this way part of what it lost by the reduction, and besides the product of the tax on the private railroads. France has always had a ticket tax.

Cars have been designed for transfer from the standard gage on the German and Austrian border to the Russian 5 ft. gage. Perhaps many have already forgotten that until about 1878 most of the railroads south of the Ohio had the 5 ft. gage, and transfer yards at Louisville, etc., were a necessity of traffic. With our system of trucks, the transferring apparatus was comparatively simple; and at some places it was claimed that it would almost do itself. Four-wheeled cars, however, such as they have in Europe, are not so easily managed.

Pintsch Side Lights for Suburban Coaches.

The New York Central has tried Pintsch side lights in several suburban coaches with satisfactory results. The general style of the fixtures, as well as the manner of applying, may be seen in the accompanying illustrations. The side deck center suspension lamp, known as

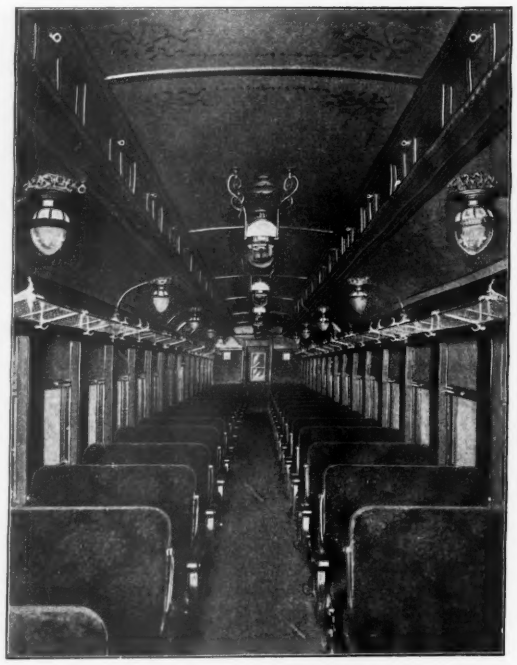


Fig. 1.

Pintsch lamp No. 442, has all of the draught proof features of the standard Pintsch center lamp, and is proving efficient in service. It is fitted with a two-flame burner, and so consumes but half the amount of gas that a center lamp burns. These fixtures are suspended from the side deck directly over the seats, as shown in the first illustration. The lamp shown in the second illustration is known as the No. 373 bracket. These lamps are fastened to the panels between the windows. They are single flame, open burners, fitted with opal shades, and give a pleasant light, especially when used in combination with the regular number of center fixtures. These lamps are made by the Safety Car Heating & Lighting Co.

Fig. 2.

TECHNICAL.

Manufacturing and Business.

The Males Company, dealer in railroad equipment, has removed to 34 and 36 Wall street, New York City.

The Trojan Car Coupler Company has removed its Chicago office from 1143 to 1520 Monadnock building.

J. T. Campbell, of West Palm Beach, Fla., it is reported, is in the market for tools and equipment for machine shops.

The Edwards Headlight Company, of Cincinnati, it is reported, will remove its works to Laporte, Ind., and put up new buildings.

The American Blower Company, Detroit, Mich., is furnishing an induced-draft apparatus for the Chicago, Burlington & Quincy at Savanna, Ill.

Messrs. Okura & Co., Tokio, Japan, are asking for specifications for locomotives for immediate delivery. Their New York office is at 11 Broadway.

The Pennsylvania Brake Beam Company, of Reading, Pa., has been organized to make railroad supplies. Eugene N. Applebaugh, of Reading, is a director.

The Amboy Machine Company, of Perth Amboy, N. J., has been incorporated with a capital of $30,000 by John A. Milliken, J. M. Derby and A. H. Derby.

J. Jacob Shannon & Co., 1744 Market street, Philadelphia, Pa., have been appointed Eastern Representatives by the Vulcan Iron Works Company, Toledo, Ohio.

The office of the Locomotive & Machine Company of Montreal, Ltd., was moved May 1st from the Street Railway Chambers to the Imperial Bank Building, Victoria Square, Montreal.

The Southern Mahratta Railway Company, Ltd., India, is reported in the market for about 3,500 tons of structural steel, rails, etc. The chief offices of the company are at 46 Queen Anne's Gate, Westminster, London, S. W.

The Ross Impassable Cattle Guard Company, Powderly, Ky., has received through J. G. White & Co. an order for a carload of cattle guards to be installed on the lines of the Northern Traction Company, La Fontaine, Ind.

The Watson-Stillman Company announces the removal of its offices and a large stock of goods to 46 Dey street, New York City, and also announces the removal of its machinery to the new works at Aldene, Union County, N. J.

A successful road trial of an Oldsmobile inspection car was made recently on the Boston & Albany, near Pittsfield. For a description of this railroad automobile, with illustrations, see the *Railroad Gazette* Nov. 20, 1903, p. 833.

The Red Star Co., dealer in railroad supplies, at Rochester, N. Y., has sold out its entire business to a corporation—The Liberty Headlight & Lantern Co. Mr. Foulkes, President of the Red Star Co., becomes President of the new company.

The International Railway Signal Company has been organized at Winston-Salem, N. C., and an application has been made to the State authorities for a charter; capital, $250,000. The corporation is formed to make a signaling device invented by C. R. Traxlor.

Mr. George Groobey, Chief Inspector of Safety Appliances for the Interstate Commerce Commission, has resigned his place with the Commission and is to become connected with the Buckeye Steel Castings Company, Columbus, Ohio, maker of the Buckeye coupler.

The Canadian Locomotive Company, of Kingston, Ont., has given a contract to the Chambersburg Engineering Company for the installation of the hydraulic riveting and flanging plant to be added to its works, which will be one of the largest of its kind and add to the output.

The Kornit Manufacturing Company, of Orange, has been incorporated in New Jersey with a capital of $500,000 to make machinery, tools, boilers, etc. The incorporators are: St. John Alexander, of Orange, N. J., and Wm. B. Vause and F. C. Vause, of Brooklyn, N. Y.

Announcement is made of the dissolution of the firm of Charles H. Davis and partners, engineers and architects, 25 Broad street, New York. John S. Griggs, Jr., Timothy W. Sprague, and Charles H. Davis, who were formerly in the firm, announce that they will still be located at 25 Broad street.

The Owego Bridge Company, Owego, N. Y., has been reorganized by the Transit Contract Company, of Philadelphia and New York, which recently secured control. E. S. McNaull, formerly with the King Bridge Company, is President, and W. N. Conger, of the National Bridge Company, is Vice-President. The general office is now in the Land Title Building, Philadelphia, Pa. The works at Owego are to be enlarged and the company will make a specialty of railroad bridges and structural work.

The Wheel Truing Brake-Shoe Company, Detroit, Mich., maker of wheel grinding brake-shoes, has an attractive exhibit at space 117, Electricity Building, World's Fair, St. Louis. Shoes of various sizes and designs, adapted for different uses, are shown, some being designed for removing flats from chilled iron wheels of electric cars, some for dressing down flattened locomotive driver wheels and others for dressing down tread-worn or grooved tires of locomotive drivers. The company reports a growing business in the electric field in addition to a large trade among the steam roads.

The following cars and locomotives were among orders recently received by the Standard Car Truck Company, Chicago, all to be equipped with Barber lateral-motion trucks: Chicago, Lake Shore & Eastern, 250 100,000 lbs. cars; Canadian Pacific, 1,600 cars; Erie Railroad, 200 refrigerator and 15 milk cars; Delaware, Lackawanna & Western, 1,000 box and 500 steel cars; Goodwin Car Co., 60 special dump cars; Great Northern, 27 special fish cars; Central R. R. of New Jersey, 10 special cinder cars; A. E. Bryan Company, Chicago, two special-pur-

pose cars; Norfolk & Western, four locomotive tenders; Bismarck, Washburn & Great Falls, one locomotive. The Norfolk & Western locomotives are on exhibition at the World's Fair.

The Chicago Railway & Commercial Institute, 95-97 Washington street, has a telegraph department which seeks to supply the continual demand of the railroads for competent operators. Its Director of Telegraphy is said to be not only an expert operator but a thorough teacher with a wide range of experience. The school is thoroughly equipped, it is claimed, and supplied with expert instructors, the object being to send its graduates out as finished operators. The students of the telegraph department are allowed the privileges of the freight traffic department, where they are made acquainted with the billing out of freight from original transactions furnished the school by the railroads, station accounts, etc., in order to fit them for the duties of station agent. Advantage is claimed from the location of the school in Chicago where students can keep in close touch with the numerous great railroad systems having headquarters or important offices there, furnishing the best possible opportunities for securing positions.

Mr. Putnam A. Bates, formerly Assistant Secretary and Sales Manager of the Crocker-Wheeler Company, and Mr. John Neilson, late Assistant Secretary and Treasurer of the New York & Stamford Electric Railway Company, have formed a partnership under the firm name of Bates & Neilson, and will conduct the general practice of consulting electrical engineering, with offices at 42 Broadway, New York City. Mr. Bates is a Columbia graduate and has had a wide and varied experience of seven years with the Crocker-Wheeler Company, during which time he studied electrical properties in nearly every State in the United States. He is a member of the American Institute of Electrical Engineers and the New York Electrical Society. He has just returned from a short vacation and trip to England, where he made a careful study of the manufacturing conditions and engineering subjects in which he has specialized. Mr. Neilson has had a professional experience of about ten years, principally in connection with central station lighting and power plants. He was, prior to his position with the New York & Stamford Electric Railway Company, for some time Vice-President and Superintendent of the Larchmont Light & Power Company.

Iron and Steel

Owners of the Shenango Valley furnaces, it is reported, have begun the organization of a new steel concern; Youngstown men have subscribed $2,000,000 towards building the steel mill.

The American Steel & Wire Company has given a contract to the Hunkin Bros. Construction Company for the foundation work for its new furnaces and other work at its central blast furnaces, Cleveland, Ohio.

The Pacific Steel Company, recently incorporated at San Diego, Cal., with a capital of $100,000,000, it is reported, has bought extensive iron deposits at the mouth of the Balzas River in Mexico. It has also received from the government large iron deposits near the Pacific Coast in the State of Michoacan. The company proposes to build smelters and steel works on its Mexican property, with the expectation of finding a market in Central and South American countries. S. A. Dohuel, of Cleveland, Ohio, is Secretary.

Official announcement has been made by the United States Steel Corporation that it has completed the purchase of the Clairton Steel Company properties from the Crucible Steel Company. By the terms of the agreement, the new owners guarantee the yearly interest of the Clairton Company's securities, aggregating $13,000,000, and the delivery of $1,000,000 United States Steel sinking fund 5 per cent. bonds. The Crucible Company agrees to buy annually 120 tons of steel and 80,000 tons of pig iron from the United States Steel Corporation for a period of ten years.

A Shipping Commission.

Before adjourning, Congress appointed a commission to recommend legislation for the development of the American merchant marine. The commission is composed of Senators Gallinger, Lodge, Penrose, Martin and Mallory and Representatives Grosvenor, of Ohio; Minor, of Wisconsin; Humphrey, of Washington; Spight, of Mississippi, and McDermott, of New Jersey. The first meeting of the commission was held at the Capitol at Washington, on April 30, Senator Gallinger being elected chairman and sub-committees for the North Atlantic, South Atlantic and Gulf, and Pacific coasts being appointed. The commission will meet in the Chamber of Commerce, New York, on May 23 at 2 p. m., when the first hearings before the sub-committee on the North Atlantic coast, and the taking of testimony will begin.

Hospitality Extended by the St. Louis Railway Club.

The St. Louis Railway Club gives notice that arrangements have been made by the club for a large room on the second floor of the Palace of Transportation at the St. Louis Fair, and this room has been fitted up to comfortably care for club members and their friends during the Exposition season. The furniture, library, etc., of the club and the various periodicals heretofore sent to the club room will be found there, and it is proposed also to invite organizations connected with railroad service to hold there such sessions as they may desire. The quarters are ample to properly care for a good sized gathering. Members of other railroad clubs, railroad men generally, and the press, are cordially invited to call on the St. Louis Club and make themselves at home at the headquarters.

The Union Engineering Building.

The preliminary work of the Conference Committee on the Union Engineering Building in New York City has been closed, and architectural designs are to be submitted to Professor F. R. Hutton, Secretary of the Committee, by June 15. The firms of Carrere & Hastings, Palmer & Hornbostel, Clinton & Russell, Lord & Hewlett, Whitfield & King, and Ackerman & Partridge have been asked to submit plans, for which they will each receive $1,000, to be charged against the commission of the successful firm. There is also an open list of competitors who have the encouragement of four equal prizes of $200 each for the four best designs.

The engineering building will occupy about 10,500 sq. ft. exclusive of the 15-foot open space reserved under the city ordinance, the outside dimensions of the land being 100 x 125 ft. To the east of the building, on Thirty-ninth street, Mr. Carnegie has bought and reserved a residence, which will be maintained at its present elevation so as to protect the air and light of the building on that side. The Engineers Club, to be built in connection with the engineering building, will have a frontage of 50 ft. on Fortieth street and Bryant Park, and a depth of 100 ft. It is the expressed wish of Mr. Carnegie that the architecture of both buildings shall be simple and dignified; something that will be as good in style a hundred years from to-day as now. (*Railroad Gazette*, March 4, p. 164.)

An Automatic Break-in-Two Signal.

Messrs. H. E. Butler and J. L. McCollum, of Atlanta, Ga., have patented an arrangement for giving notice by a bell in the caboose of a freight train if the train breaks in two, and the device is described in patent No. 752822, issued February 23, 1904. Mr. McCollum is Superintendent of the Western & Atlantic (Atlanta Division of the Nashville, Chattanooga & St. Louis).

The invention was devised particularly with a view to the prevention of serious collisions when a break occurs behind the air-braked cars in a train which is partly air-braked, though it is adaptable to a train of any length and without regard to the presence or absence of air brakes. An ordinary bell rope is fastened to the last air-braked car and is strung along back over the tops of the non-air cars to the cupola of the caboose, where it is fastened to a slide, which, when moved forward, closes the circuit of an electric bell. In case of the separation of the cars of the train at any point, producing sufficient tension on the cord, the slide is pulled forward a few inches; and this movement unlocks a catch which releases the cord, allowing it to be pulled forward without breaking; and it also allows two flat springs to come in contact with each other, closing the circuit to the bell, which is energized by a dry battery. The bell will ring until the conductor or brakeman opens its circuit. The movement of the slide is arranged to clean the surfaces of the flat springs by rubbing, so as to insure a good contact.

THE SCRAP HEAP.

Notes.

On the Bessemer & Lake Erie the lamps in the fixed signals are to be changed so that the all-clear night indication shall be green; the two colors in the distant signals being green and yellow.

The Michigan Central on April 29 applied to the United States Circuit Court at Chicago for injunctions against 28 Chicago ticket brokers to restrain them from dealing in non-transferable contract tickets.

At New York on May 24 the Interstate Commerce Commission will reopen its inquiry on the complaint of Hearst against the Reading, and other coal companies, alleging exorbitant rates on anthracite coal from the mines to New York.

The president of the Grand Rapids & Indiana in his last annual report says that while the State of Michigan has ordered a reduction in the passenger rate of that road, reducing its income, it has at the same time doubled the taxes of the company. The valuation of the company's property has been so increased that the taxes take 30 per cent. of the company's gross receipts.

The railroads in Iowa have been compelled to revoke their order discontinuing return passes for live stock drovers, the State Railroad Commission having threatened to order a reduction in the rates on cattle if the passes were not restored. The restoration of passes in Iowa will no doubt make necessary the same change on all lines between Chicago and the Missouri river.

In some of the sleeping cars of the Chicago, Milwaukee & St. Paul passengers may now have electric lights in the upper berths. The sockets are fixed in the berths, but for the lamp the passenger must apply to the porter. Electric lamps in the sleeping car berths of this company are now arranged so that full power can be turned off and a one candle-power light left lighted.

Certain members of the Canadian Parliament, on the discussion of a bill to ratify the agreement between the Pere Marquette and the Michigan Central by which the P. M. is to use Michigan Central tracks, have demanded that, as a condition of ratification, both of these roads shall reduce passenger fares to the basis of the rates which are charged by the same companies in the United States. In Michigan passenger fares have lately been reduced in accordance with a law of the State under which a marked increase in passenger earnings must be followed by a reduction in fares.

In the United States Circuit Court of Appeals at Philadelphia, May 2, the suit of the Western Union Telegraph Company against the Pennsylvania, which arose out of the summary cutting down of poles by the railroad company when the term of the Western Union contract expired, was sent back to the lower court for a new trial, Judges Gray, Acheson and Dallas holding that the telegraph company has a right to a further and more thorough trial of the issue.

Fast Run on the Michigan Central.

On Wednesday, April 27, a special train over the Michigan Central, carrying officers of the road, was run from Niagara Falls to St. Thomas, Ont., 115 miles in 97 minutes; equal to 71.1 miles an hour. From St. Thomas to Windsor, 111 miles, the time was 94 minutes, 30 seconds; from Shedden to Essex, 86.28 miles, the time was 66 minutes (78.53 miles an hour). These figures are taken from press despatches; if correct they establish a new speed record. The weight of the train is not given.

Fast Run From Plymouth to London.

A press despatch from London, April 30, says that a train of the Great Western Railway, carrying American mails, ran from Plymouth to London, on that day, 247 miles in 237 minutes, which is equal to 62.5 miles an hour. A distance of 118 miles was traversed in 99 minutes (71.5 miles per hour).

Lockout at Topeka.

On the morning of Monday, May 2, the shops of the Atchison, Topeka & Santa Fe, at Topeka, were kept locked and all the employees excluded, the officers of the road having learned that a strike was to be declared on that day. Sixty-five men had struck at Albuquerque three days before, on account of the employment of non-union machinists. By Tuesday morning matters had been arranged so that all of the workmen returned except 200 union machinists, whose leader says that they will not return until the company satisfies their demands. It is said that the lockout order was carried out at all of the shops on the line of the road, as far west as Albuquerque; but the number of men affected is nothing like 10,000, the number mentioned in press despatches. An officer of the road says that the names of a large number of applicants are on the books of the company and that the machinists' strike will not cause serious disturbance in the work of the shops.

Pennsylvania Railroad Tourist Bureau.

"The personally conducted tourist bureau" of the Pennsylvania railroad has just sent a party of 850 persons from New York and Philadelphia to Los Angeles, the occasion being the General Conference of the Methodist Episcopal Church; and, according to a statement given out by the passenger department of the road, the excursion is believed to be the largest ever conducted under a single management at one time. There were seven special trains, six of them starting from Jersey City on one day (April 27). These six trains, with eight regular through trains, were started from Broad Street station, Philadelphia, within 27 minutes, on Wednesday noon. The excursion trains were equipped with dining cars, and there were chaperons, ladies' maids, special baggage masters, and stenographers. As both the Pennsylvania railroad and the Methodist Episcopal Church have long since passed out of their teens the reason for having a chaperon is not exactly clear; but then, that is none of our business. The Pennsylvania Tourist Bureau has now been in operation since 1891, and it is said that its business has increased each succeeding year.

A Familiar Incident With a Variation.

Methodist ministers have never suffered, by comparison with those of other names, in regard to the element of romance or poetry in their public effusions, and the lofty flights of Methodist orators have given pleasure to millions; but whether Dr. S. W. Thomas, editor of the *Philadelphia Methodist*, is greater in prose or in poetry, fact or in fiction, we do not know. His version of an incident in a personally conducted excursion is published in the press despatches of Wednesday last, as follows:

"More than three thousand Methodists on their way to the General Conference in Los Angeles, were stranded in the Grand Canyon of the Colorado without food and water from three o'clock Sunday until late Monday. More than eight hundred were forced to remain until the next morning.

"About half-past two o'clock Sunday afternoon seven sections of the delegate specials landed in the Canyon. Every car was dangerously loaded when the train began the ascent from Williams' Junction. The strain was too severe. Several of the engines went 'dead' and the roadbed gave way, causing a general wreck. Away from food and water, without necessary provisions with them, the Conference delegation, three thousand strong, poured down upon the Canyon Hotel. The manager had expected about eight hundred. He made provision for one thousand, and the consequence was everyone suffered both for food and drink. All Sunday afternoon trainmen, hotel hands, ranchers and Methodists helped to construct a new railroad. It was literally a Methodists' railroad. On its completion depended the lives of the three thousand. Sunday night the work was continued.

Monday morning found every able-bodied man at the pick and shovel, and so it continued until nearly sundown Monday afternoon. The new rail was built around the wreck and the first load of wornout Methodists pulled out for Los Angeles about four o'clock."

Transportation to the June Conventions.

Announcement is made that in the Trunk Line territory, i. e., east of Pittsburg and Buffalo, the New York Central, Erie and Delaware & Hudson will extend the courtesy of free transportation to the Saratoga conventions of the Master Car Builders' and Master Mechanics' associations, to members of the associations who are actual employees of railroads, and the immediate members of their families, when applied for by the proper officer of the road by which the member is employed.

For those attending the conventions who cannot avail themselves of the above, arrangements have been made with the different passenger associations for a rate of one and one-third fare for the round trip under what is called the certificate plan. The procedure under this plan is as follows: A person buying a ticket to Saratoga should procure from the ticket agent at the time of purchase a certificate (not a receipt) of the fact of said purchase, stating as the reason for the procurement of the certificate, attendance on the conventions of these associations. Immediately upon arrival at Saratoga, or as soon thereafter as possible, the certificate should be handed to Mr. J. Alex. Brown, Secretary of the Supply Men's Association, for endorsement by the agent of the Passenger Association, who will be at Saratoga. When the certificate is indorsed by the agent of the Passenger Association it will entitle the holder to purchase at Saratoga a non-transferable return ticket good for a continuous trip over the same route for one-third the regular limited fare.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad associations and engineering societies see advertising page 16.)

Engineers' Club of Philadelphia.

A business meeting of this club will be held on the evening of May 7, at which an illustrated paper on the "Sterilization of Water by Ozone" will be presented by A. Bosmaer, of Holland.

Franklin Institute.

At a meeting of the sections held in Philadelphia, May 5, the programme included a paper on "Methods and Apparatus Used in the Examination of Nitrocellulose and Nitrocellulose Powders," with illustrations, by Albert P. Sy, Sandy Hook, N. J.

American Society of Civil Engineers.

At the meeting of this society, held May 4, in New York, a paper by Messrs. Charles L. Harrison and Silas Woodard, members of the society, entitled "The Lake Cheesman Dam and Reservoir" was presented for discussion and illustrated with lantern slides.

Railway Signal Association.

In addition to the subject of Definitions, which is to be the first topic for discussion at the meeting of this association in New York City, next Tuesday, the following question will be brought up:

"Is it practical to extend the control of distant signals so as to give true indications of the position of home signals in a system of automatic block signals on single track where the home signals are staggered?"

PERSONAL.

—Mr. Howard D. Taylor, the new Superintendent of Motive Power and Rolling Equipment of the Philadelphia & Reading, is about 38 years old. Mr. Taylor is a native of Philadelphia, and for five years, from 1882, was with the Baldwin Locomotive Works. In 1887, he went to Scotland and was with Neilson & Co., of Glasgow, for a short time. The next year he returned to the United States, and was, for a year or so, with the Schenectady Locomotive Works at Schenectady. In 1890-92 he was with the Cooke Locomotive Company; in 1892 was Engineer of Tests on the Erie, and in 1894 held a similar position on the Lehigh Valley. The next year he was made Mechanical Engineer, and from 1897 to 1899, was Master Mechanic at Wilkesbarre. In the latter year (1899) he went to the Calumet & Hecla Mining Company, Calumet, Mich., but two years later returned east to take the position of Superintendent of Motive Power of the Lehigh Valley. Mr. Taylor's new appointment dates from Monday of this week. His office will be at Reading, Pa.

—Mr. Glasenapp, who has just resigned his position in the railroad department of the Prussian Ministry of Public Works at Berlin, was for several years the technical attaché of the German Embassy to this country, much of the time residing in Chicago, and doubtless known to many American railroad men. He was in this country until quite recently, having been sent to Berlin only a few months ago.

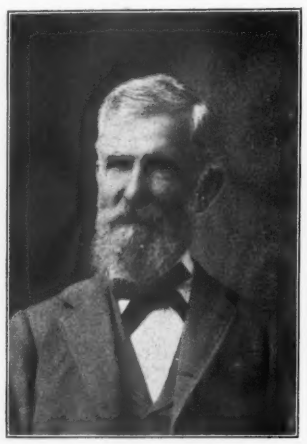
—Mr. Alex. W. Whiteford has been appointed Superintendent of the Locomotive and Car Shops on the Nebraska Division of the Union Pacific. This is a newly created position. Mr. Whiteford was formerly piece-work inspector at the new Omaha shops, and is one of the young graduates of the Burlington, having served his time at Beardstown, Ill., and then as piece-work inspector at St. Joseph, whence he went to the Union Pacific a year and a half ago. His promotions were earned through the remarkable savings made by improvements in shop operations which were recommended as a result of his inspections and suggestions.

—Mr. C. L. Pasho, the new Assistant Superintendent of the Bessemer & Lake Erie, began his railroad work in 1873, as a messenger boy on the Erie Railroad. Later he was made an operator and train despatcher, serving over ten years at Dunkirk and Hornellsville, N. Y. From this road Mr. Pasho went to the Buffalo, Rochester & Pittsburg as chief train despatcher, and was successively trainmaster and superintendent of telegraph. From then until about seven years ago, when he went to the Bessemer & Lake Erie, he has held various positions on different roads.

—Mr. W. H. Williams, who has gone from Baltimore to St. Louis, to be Superintendent of Freight Transportation of the St. Louis & San Francisco, is 30 years old. He was born at Athens, Ohio, June 25, 1874, and has been in railroad service since 1890. He began as Assistant Cashier in the local freight office at Toledo on the Pennsylvania Lines, but resigned from that position to take a business college course. In the fall of the next year (1891) he went to the Pittsburg & Lake Erie, and in February, 1892, returned to the Pennsylvania Company and became stenographer in the office of the Superintendent of Telegraph at Pittsburg, later being appointed to a similar position in the office of the General Manager. In January, 1901, he became chief clerk to the Fourth Vice-President and six months afterward was appointed Assistant Secretary of the Baltimore & Ohio. Mr. Williams had held the position he now leaves, that of Assistant to the General Manager of the Baltimore & Ohio, since September, 1902.

—Mr. Stephen Sult, who died at his home in Lockport, N. Y., last week, Thursday, at the age of 92, is spoken of as having been the oldest employee of the New York Central; and, according to a local paper, his railroad career extends back to 1833, or within four years of the advent of the Stourbridge Lion, the first locomotive that turned a wheel in America. Mr. Sult began his railroad work in 1833, laid track at Niagara Falls in 1836, and was roadmaster of the New York Central in 1853. For many years he had received a pension from the New York Central.

—Mr. D. H. Ainsworth died at his home in Des Moines, Iowa, on April 24, at the age of 76. He was born March 8, 1828, at Cape Vincent, N. Y., where his father had a general store and a lumber business on the St. Lawrence river. When he graduated from Hobart College in 1850, the Erie canal was the great highway across the State of New York. Its enlargement was under way and Ainsworth secured a position as Second Assistant Engineer. Political influence counted for more than honesty and ability, and the young engineer soon became entangled in petty controversies with dishonest contractors and with his superior officers, and in June, 1852, resigned. He worked on the early surveys of the Syracuse & Binghamton, and later went west and began his life work in railroad location in the States lying in the Mississippi and Missouri river valleys. In 1893, Mr. Ainsworth, having retired from active service, after more than 40 years of hard work, gathered together in a little book, which he called the "Recollections of a Civil Engineer," accounts of some of his disappointments as well as his successes, during what was, perhaps, the greatest epoch in railroad construction in this country, or in the world. In 1865 he took charge of the surveys for the Union Pacific, and he remained in the engineering department of that road through all the troublous times before General Dodge finally took up the work and carried the line through to the connection with the Central Pacific. Mr. Ainsworth made nearly all the surveys for the revision of grades out of Omaha, and because he was firm in the belief that the most favorable point for crossing the Missouri river was at Bellevue Landing and not at Omaha, and because he insisted on these views he became entangled in a controversy with the real estate land boomers of Omaha, who had more or less influence in Washington and who controlled State politics. Perhaps for this reason he was never duly credited for his great work. This is only one example of the misunderstandings and unfortunate disagreements with which a conscientious, honest, and efficient engineer burdened himself through life. Comparatively few have ever heard of the pioneer work which this man did, for he moved from place to place before he achieved the credit which was due to him. During the narrow-gage mania decade, in the '70s, the *Railroad Gazette* was alone among all the technical publications of the world in refuting the theory and proving that, within limits, the gage was not a considerable factor, and that a standard gage for the whole country was essential for economy. During this period Mr. Ainsworth wrote much for the *Railroad Gazette* and was an able supporter, for he was engineering in the region where the farmers and the communities were being mulcted with the catch-penny idea, subscribing for millions of narrow-gage railroad bonds and stocks, which speedily became worthless. Naturally a man of decided temperament, rugged, honest, and unyielding where principle is involved, it irritated him—often unnecessarily so—to be overruled or interfered with in doing what he conceived to be his plain duty by men who were less scrupulous and who thought of other things than the honesty of any transaction. Ainsworth was a type of a class which seems to be growing smaller—a grand old man of that peculiar stern integrity which worked out so as to make him avoid, rather than seek, high place.



—Mr. A. M. Cleland, whose promotion to succeed Mr. Fee as General Passenger Agent of the Northern Pacific was recently announced, has been in railroad work (with the exception of about two years) for the past 25 years. His first service was as ticket agent in Chicago. Later he was assistant ticket agent for the Chicago, Milwaukee & St. Paul at Chicago. For about two years he was out of railroad business, but in 1891 took a position on the Northern Pacific. For four years, from 1892, he served as ticket and voucher clerk in the general passenger department, later being made chief clerk. Upon the retirement of Mr. Craig, in 1901, Mr. Cleland was appointed Assistant General Passenger Agent, and has since held that office.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—As more fully stated in another column, this company has established a Tie and Timber Department, with office at Topeka. The head of this department, E. O. Faulkner, will be in charge of the extensive works of the company devoted to the treatment of sleepers and timber. Mr. Faulkner was heretofore Assistant to the General Manager. The company has also established a statistical office, at Chicago, and about 30 clerks are to be transferred to that city from Topeka. This new department will be under the charge of James Peabody, Chief Statistician. Mr. Peabody has done statistical work for several years but without a permanent force.

Atlantic City.—See Philadelphia & Reading.

Baltimore & Ohio.—See St. Louis & San Francisco.

Boston & Maine.—On May 1 the Freight Claims department was transferred to the Accounting department.

Burlington & Missouri River in Nebraska.—W. W. Johnson has been appointed Assistant General Freight Agent, with headquarters at Omaha, Neb.

Chicago, Burlington & Quincy.—W. E. Crane has been appointed Coal Traffic Manager.

Colorado Springs & Cripple Creek District.—D. C. McWatters has been appointed General Passenger Agent, and B. F. Williams has been appointed General Freight Agent, both with headquarters at Colorado Springs.

Detroit & Toledo Shore Line.—J. P. Lane has been appointed Superintendent and Traffic Manager, with headquarters at Detroit, Mich.

Detroit Southern.—T. J. Madigan has been appointed General Roadmaster, with office at Springfield, Ohio.

El Paso-Northeastern.—D. Sullivan has been appointed Superintendent of Transportation, with headquarters at Alamogordo, N. Mex.

Erie.—H. B. Hunt and T. Rumney have been appointed Assistant Mechanical Superintendents, with office at Meadville, Pa. Wm. Schlafge has been appointed Master Mechanic of the New York Division, with office at Jersey City, N. J., succeeding Mr. Rumney.

Galveston, Harrisburg & San Antonio.—A. S. Johnson has been appointed Superintendent, with headquarters at El Paso, Tex., succeeding G. F. Hawks, resigned. (See Texas & New Orleans.)

Grand Trunk.—P. J. Lynch, hitherto Trainmaster at Stratford, has been appointed Assistant Superintendent in charge of Transportation, with office at Allandale, Ont.

Great Northern.—J. F. Morrow has been appointed General Advertising Agent.

Kansas City Belt.—A. J. Davidson (President of the

Frisco) has been elected Vice-President, succeeding B. L. Winchell, resigned.

Northern Pacific.—E. J. Pearson, hitherto Acting Chief Engineer, has been appointed Chief Engineer, with headquarters at St. Paul, Minn.

A. M. Smith has been appointed Assistant General Passenger Agent, with headquarters at St. Paul, Minn.

Pennsylvania.—W. L. Davis has been appointed Assistant Master Mechanic at Buffalo, N. Y.

Philadelphia & Reading.—Howard D. Taylor, hitherto Superintendent of Motive Power of the Lehigh Valley, has been appointed Superintendent of Motive Power and Rolling Equipment of this company and the Atlantic City R. R., with headquarters at Reading, Pa., succeeding Samuel F. Prince, Jr., resigned, effective May 2.

St. Louis & San Francisco.—W. A. Nettleton has been appointed General Superintendent of Motive Power, with headquarters at St. Louis, Mo.

W. H. Williams, hitherto Assistant to the General Manager of the Baltimore & Ohio, has been appointed Superintendent of Freight Transportation (yard and station service) of the St. L. & S. F., with headquarters at St. Louis, Mo.

St. Louis, Iron Mountain & Southern.—The jurisdiction of J. M. Walsh, Superintendent of Terminals, St. Louis, Mo., has been extended to include that portion of the Illinois Division located north of Mobile & Ohio crossing, including East St. Louis and Bixby agencies. This includes the Ivory and East Ivory boat transfer.

Southern.—S. H. Hardwick has been appointed Passenger Traffic Manager, with headquarters at Washington, D. C., succeeding the late W. A. Turk. W. H. Tayloe has been appointed General Passenger Agent, with headquarters at Washington, D. C., succeeding Mr. Hardwick, and Mr. Tayloe in turn is succeeded by Brooks Morgan as Assistant General Passenger Agent, with headquarters at Atlanta, Ga.

The duties heretofore performed by W. H. Green, Assistant to General Manager (deceased), are to be assumed by R. A. Dugan, Assistant General Manager.

Suffolk & Carolina.—On May 1 the office of Traffic Manager was abolished and C. L. Hutchins, hitherto discharging the duties of that position, has become Auditor. Garrett J. Hart, heretofore Auditor and Freight Claim Agent, will continue as Freight Claim Agent. John R. Cockey, Chief Clerk to Auditor, becomes Car Accountant, and A. S. Weisiger will assume the duties of General Freight and Passenger Agent. The headquarters of all will be at Suffolk, Va.

Tennessee Central.—The following offices have been abolished: Chief Engineer, Purchasing Agent, Assistant Superintendent and Roadmaster. These offices were held respectively by W. N. McDonald, O. M. Laing, O. M. Sewell and J. C. Davis. The position of Engineer of Maintenance of Way has been created, and Mr. McDonald has succeeded to the office. The position of Engineer of Construction has also been created. This will be filled by A. Philbrick. The position of General Storekeeper has been created, with office at the Tennessee Central shops. O. M. Laing, who has been Purchasing Agent, becomes General Storekeeper. O. M. Sewell, Assistant Superintendent, will remain with the road, although in some other capacity, to be announced at a later date. J. C. Davis, who was Roadmaster, will be made a Supervisor.

Texas & New Orleans.—G. F. Hawks, hitherto Superintendent of the Galveston, Harrisburg & San Antonio, has been appointed Superintendent of the T. & N. O., with headquarters at Houston, Tex.

Union Pacific.—Alex. W. Whiteford has been appointed Superintendent of the Locomotive and Car Shops on the Nebraska Division.

Vandalia.—J. E. Mechling has been appointed Master Mechanic, with headquarters at Terre Haute, Ind., succeeding F. F. Hildrith, who has been appointed Mechanical Engineer.

W. E. Burk has been appointed Superintendent of Terminals, with office at St. Louis.

LOCOMOTIVE BUILDING.

The Arizona Copper Co. is having one locomotive built at the Baldwin Locomotive Works.

The Central Ontario is having two locomotives built at the Canadian Locomotive Co.'s Works at Kingston, Ont.

H. K. Porter & Co. has secured an order for a number of locomotives for shipment to Mexico. This order was placed by the contracting firm of Ugarte & Garcia, Guadalajara, Mex. It is reported that this latter company is in the market for extra railroad equipment.

The Chicago, Lake Shore & Eastern, as reported in our issue of last week, has ordered eight switching (0-6-0) and four Consolidation (2-8-0) locomotives from the American Locomotive Co. The switching locomotives will weigh 130,000 lbs.; cylinders, 19 in. x 26 in.; diameter of drivers, 51 in.; working steam pressure, 180 lbs.; 270 tubes 2 in. in diameter and 10 ft. 6 in. long; fire-box, 96 in. long and 33½ in. wide; tank capacity, 4,000 gallons of water, and coal capacity, eight tons. The Consolidation locomotives will weigh 188,000 lbs., with 169,000 lbs. on drivers; cylinders, 22 in. x 28 in.; diameter of drivers, 51 in.; working steam pressure, 200 lbs.; 372 tubes; fire-box, 96 in. long; tank capacity, 7,000 gallons of water, and coal capacity, 13 tons. The special equipment for both includes: Westinghouse air-brakes, Carnegie boiler lagging, Ohio injectors, American valve-rod packings, Coale safety valves, Nathan sight-feed lubricators, National-Fulton journal bearings for Consolidation locomotives and Midvale driving, truck and tender wheel tires.

The Southern Indiana is having five simple passenger and five Mogul (2-6-0) locomotives built at the Rogers Locomotive Works and not at the Baldwin Locomotive Works, as stated in our issue of April 22. The passenger locomotives will weigh 120,000 lbs., with 78,000 lbs. on drivers; cylinders, 18 in. x 26 in.; diameter of drivers, 58 in.; extended wagon-top boiler, with a working steam pressure of 190 lbs.; heating surface, 1,916 sq. ft.; 280 charcoal iron tubes 2 in. in diameter and 11 ft. 9 in. long; fire-box, 96 in. x 40 in.; grate area, 27 sq. ft.; tank capacity, 5,000 gallons of water, and coal capacity, 10 tons. The 2-6-0 locomotives will weigh 135,000 lbs., with 118,000 lbs. on drivers; cylinders, 20 in. x 24 in.; diameter of drivers, 52 in.; straight radial stayed boiler, with a working steam pressure of 180 lbs.; heating surface, 1,490 sq. ft.; 256 charcoal iron tubes 2 in. in diameter and 11 ft. 1 in. long; fire-box, 96 in. x 33 in.; tank capacity, 4,500 gallons of water, and coal capacity, eight tons. The special equipment for both includes: Westinghouse air-brakes, Taylor hammered iron axles, Simplex brake-beams, Washburn couplers on pilot and Tower couplers on tenders, Ohio injectors, Jerome piston rod and valve rod packings, Ashton safety valves, Leach sanding devices, Chicago sight-feed lubricators, Pittsburg Spring & Steel Co.'s springs, Crosby steam gages, Midvale driving wheel, truck wheel and tender wheel tires, cast-steel wheel centers, McIntosh whistles, Simplex bolsters, Homestead blow-off valves and Cooke-auto bell ringers.

CAR BUILDING.

The Erie is in the market for 250 box cars.

The Norfolk & Western is in the market for 26 passenger cars.

The American Car & Foundry Co. has miscellaneous orders for 20 cars.

The Chicago, Lake Shore & Eastern has ordered 250 dump cars from the Pressed Steel Car Co.

The Enterprise Lumber Co. is having 10 freight cars built at the St. Louis Works of the American Car & Foundry Co.

The Central R. R. of New Jersey has ordered 10 steel dump cars of 60,000 lbs. capacity from the Standard Steel Car Co.

The East Louisiana has ordered four passenger coaches and one combination passenger and freight car from the American Car & Foundry Co.

The Wason Manufacturing Co., Springfield, Mass., has secured a contract for 15 passenger and freight cars for use on the Canton-Hankow R. R. in China.

The Kellys Creek & Northwestern has ordered 100 gondolas from the American Car & Foundry Co. J. W. Dawson, Charleston, W. Va., is General Manager.

The Chicago, Burlington & Quincy has ordered 1,000 box cars from the Western Steel Car & Foundry Co. The special equipment includes Bettendorf bolsters.

The Maine Central is having 200 Pratt patent coal cars of 60,000 lbs. capacity built at the Laconia Car Works. These cars are for delivery in May and June, 1904.

The Southern has ordered 25 first-class passenger coaches from the American Car & Foundry Co. Specifications for these cars may be found in our issue of March 4.

The Vandalia, as reported in our issue of April 29, has ordered 11 cabooses from the American Car & Foundry Co. These cabooses will be 30 ft. 1½ in. long, 1½ in. wide, with wooden frames and underframes. The special equipment includes: canvas roofs, Tower couplers, Pennsylvania standard axles, brasses and springs, and cast steel 33-in. wheels.

BRIDGE BUILDING.

ALLENTOWN, PA.—The city and the Lehigh Valley and Central Railroad of New Jersey have agreed that bids can soon be asked for the Tilghman street bridge, to cost about $73,000.

ATCHISON, KAN.—The question of building a viaduct 710 ft. long and 35 ft. high over the Missouri Pacific and the Atchison, Topeka & Santa Fe tracks is under consideration.

BELTON, TEXAS.—Bids are wanted May 14 by Dreibelbis & Co., 548 Court street, Reading, Pa., for building the steel superstructure of an electric railroad bridge with a 198-ft. span over Leon River at Belton.

BRADFORD, PA.—The Buffalo, Rochester & Pittsburg has petitioned the City Council for permission to build a bridge over Main street crossing and also to double track its line through the city.

CHICOPEE, MASS.—On April 27 the United States House of Representatives passed the bill, previously passed by the Senate, authorizing a bridge across the Connecticut River between Chicopee and West Springfield, Mass.

CONSTANTINE, MICH.—At a meeting of the Constantine and Florence township boards it was decided to ask bids for building a steel bridge over the St. Joseph River between the two townships to replace the structure carried away by high water.

E. ST. LOUIS, ILL.—The East St. Louis Suburban Electric Railway Co. is making plans to build a bridge 150 ft. long at Lansdowne.

EVERETT, WASH.—Bids are wanted May 16 by J. H. Mitchell, City Clerk, for building a steel drawbridge 233 ft. long, with two fixed spans of 124 ft. each with 22 ft. opening in the clear.

GLEN COVE, N. Y.—Bids are wanted May 9 by Solomon S. Townsend, Clerk of the Board of Supervisors, Mineola, Nassau County, for building a concrete bridge and earth fill over the Lower Mill pond at Glen Cove.

HAVRE DE GRACE, MD.—Sealed proposals will be received until May 16 by the Philadelphia, Baltimore & Washington R. R. Co. for furnishing all labor and materials to complete the masonry piers of the Havre de Grace bridge in accordance with the plans and specifications of the railroad company. The work consists of 20 piers, eight of which will probably have to be built by the pneumatic process. Plans and specifications can be obtained at the office of the Chief Engineer, Broad Street Station, Philadelphia. Only those parties need apply who have had experience in building deep-water foundations. (See advertisement on page 14.)

KEWAUNEE, WIS.—The Green Bay & Western, it is reported, is planning to build two new steel bridges near this place and to replace a number of bridges on the line of its road between Kewaunee and Maryland Junction.

MEMPHIS, TENN.—A bill passed by the United States Senate on April 23 authorizes the Kansas City & Memphis Ry. & Bridge Co. to double-track its bridge at an estimated cost of $100,000. The work will necessitate an entirely new system of steel girders and extensive changes to the superstructure.

MISSOURI.—Both Houses of Congress passed on April 27 the bill authorizing the Paragould & Memphis Railroad Co. to build a bridge across the St. Francis River in Missouri. (Feb. 26, p. 151.)

MODESTO, CAL.—The Pacific Construction Company of San Francisco, has been awarded contracts for building a drawbridge at Tuolumne City, and a bridge over Dry Creek near this city, at $41,970 for both.

NEWARK, N. J.—The Board of Free Holders of Hudson and Essex Counties approve the building of a bridge over the Passaic River from the foot of Delevan avenue to the Kearney side. Plans are being made and bids will soon be asked for the work.

PATERSON, N. J.—Bids are wanted at 8 p. m. May 6 by George W. Botbyl, County Clerk, for a new bridge at Arch street.

PRESIDIO, TEXAS.—The Kansas City, Mexico & Orient, it is reported, will build a steel bridge over the Rio Grande River.

RUSHVILLE, IND.—Bids are wanted May 17 by the Common Council for building two steel or stone concrete bridges, one of 77 ft. and the other of 104 ft. Harry Lakin is City Clerk.

SAN FRANCISCO.—The Atchison, Topeka & Santa Fe has begun work on a steel bridge over Channel street at Third street. The estimated cost of the work is $175,000.

TULSA, IND. T.—The Midland Valley R. R. has given a contract to Kahmann & McMurry, of Kansas City, for ten steel bridges including one 1,600 ft. long along the line of its road between Muscogee and Tulsa. F. A. Molitor, Fort Smith, Ark., is Chief Engineer.

WARREN, PA.—The City Council has given a contract to the Groton Bridge Co. at $22,000 for building a bridge over Conewago Creek at Pennsylvania avenue, the work to be finished by October 1.

WESTMORELAND, KAN.—Bids are wanted May 21 by C. Walker, Clerk of the Township Board, of Pottawatomie, for building a double-arch bridge over Wilson Creek.

Other Structures.

ADDISON, N. Y.—The Buffalo & Susquehanna, it is reported, will build large coal trestles and a repair shop.

ALBUQUERQUE, N. MEX.—The Atchison, Topeka & Santa Fe, it is reported, is putting up new car shops to replace those recently destroyed by fire.

BALTIMORE, MD.—The Baltimore & Ohio, it is reported, will sell the site of its former general office building, destroyed by fire, and put up a larger building for its general offices near Camden station.

BUFFALO, N. Y.—The Delaware, Lackawanna & Western, it is reported, will build a new coal trestle which will have a daily capacity of 300 cars and will be one of the largest of its kind in New York State. A new freight house is also to be built.

A new union station commission has been appointed by the Mayor to secure the building of a new union passenger station.

CLEVELAND, OHIO.—The Cleveland Foundry Company is reported to have plans ready to build a $6,000 addition to its works at the corner of Platt street.

NEW YORK, N. Y.—The New York Central has filed plans with the Building Bureau for a three-story brick building 156 ft. x 236 ft., to be built on the south side of 149th street in the Bronx, to supply the power for operating trains in the Manhattan tunnel under Fourth avenue; the cost of the foundations will be about $75,000.

NEW ORLEANS, LA.—Bids are wanted May 24 by Hugh McCloskey, President of the Board of Port Commissioners, for building the new steel shed at St. Joseph street. Bids are also wanted May 10 for building the wharf at the foot of St. Joseph street.

READING, PA.—The Reading Iron Company will build a steel structure to be used as the trading department; work will be started at once.

RENSSELAER, N. Y.—The New York Central & Hudson River, it is reported, will build a new coaling station and roundhouse on Hudson Island.

ROCHESTER, MINN.—The Chicago Great Western, it is reported, will replace the present passenger station with a new structure, work to begin in May.

SHREVEPORT, LA.—The Louisiana Railway & Navigation Co., it is reported, will build elevators, sheds and warehouses at Willow Grove landing during the summer.

SOUTH MCALESTER, IND. T.—The Kansas City, Oklahoma & Houston, it is reported, has agreed to build its shops at South McAlester, also a freight and a passenger station.

TULSA, IND. T.—This city will give a bonus of $15,000 to the Midland Valley R. R., which, it is reported, has bought land as a site for a new building to hold the general offices and division headquarters of the company.

WILLIAMSPORT, PA.—The Philadelphia & Reading, it is reported, has bought a large plot of ground in the western section of the city as a site for extensive car repair shops which are to employ about 400 men.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

ALANTIC & CAROLINA (ELECTRIC).—It is stated that work will soon be begun on this proposed electric railroad from Atlanta, Ga., to Anderson, S. C., 125 miles. The route as surveyed, passes through DeKalb, Gwinette, Jackson, Banks and Franklin counties. M. Mason, Hoschton, Ga., will be in charge of the work. The date for receiving bids for grading is not yet announced.

ARIZONA & CALIFORNIA.—An officer writes that this company was recently organized in Arizona to build a railroad from Wickenburg, on the Santa Fe, Prescott & Phœnix, in a westerly direction to the Colorado River. This line is intended to develop the mineral resources of the country through which it passes, which, up to date, have been without railroad facilities. Grading has already been begun by the Grant Bros. Construction Co., of Los Angeles, Cal. W. A. Drake, Prescott, Ariz., is General Superintendent and Chief Engineer. (April 22, p. 314.)

ASHEVILLE & RUTHERFORDTON.—Rights of way have been secured for this proposed road from Asheville, N. C., to Rutherfordton, 40 miles, and surveys are now in progress. It is stated that grading on the line will be begun about June 1. R. H. Tinglev is in charge of the surveys, and R. H. Howland, Asheville, N. C., is President. (See Construction Supplement.)

BATAVIA & WILLIAMSVILLE (ELECTRIC).—Press reports state that work will be begun on this proposed electric railroad within the next two weeks. The line is projected from Batavia, N. Y., west to Williamsville, 20 miles. Work will be begun at both ends at the same time. G. L. Lewis, Buffalo, N. Y., is President.

BUFFALO, ROCHESTER & PITTSBURG.—The Indiana branch of this road, running from Indiana Junction to Black Lick, Pa., 44 miles, has been completed and was open for traffic on May 1. An extension to the Lackawanna Steel Company's coal fields will be open on May 15. (See Construction Supplement.)

CANADIAN NORTHERN.—This company has announced that it will lay between 400 and 500 miles of track during

this year. The main line to Edmonton will be completed, if possible, and work on the line to Prince Albert will be rushed. About 60 miles of track remain to be laid on this line, as the road is already completed as far as Melford. The work will involve a new bridge over the Saskatchewan river, about 15 miles southeast of Prince Albert. The following lines will also be finished: The Arizona branch from Portage la Prairie to Carberry, the Clann William, Ridgeville & Hudson Bay branch and the Brandon branch.

CANADIAN PACIFIC.—The contract for building the new lines of this company in the West has been awarded to Foley Bros., Larson & Co., St. Paul, Minn. Work will be started at once and will include the completion of the Arcola branch, a 40-mile extension on the Kirkella branch, a 25-mile stretch east of Wetaskawin and a 25-mile branch from Lacombe. The money to pay for these extensions was arranged for in December, 1903, by the sale of $14,000,000 of debenture stock.

CHESAPEAKE & OHIO.—Press reports state that, in addition to the Big Sandy branch which this company is building from White House, Ky., to the breaks of the Big Sandy river in Virginia, 75 miles, work is also in progress on three other extensions. One of these is from the Guyandotte river to Logan and the other two leave the main line between Hinton and Charleston, and extend to the head waters of the Coal and Guyandotte rivers, respectively. (See Construction Supplement.)

CHICAGO & NORTH WESTERN.—This company has begun work on a cut-off from Crescent, northeast to Harlan, Ia., 35 miles, which will shorten considerably its main line between Chicago and Omaha. The new line will run from Crescent, north of Council Bluffs, to Harlan, crossing the Chicago, Milwaukee & St. Paul at Yorkshire. It is stated, in connection with this work, that the company will double track the main line from Council Bluffs to Carroll.

CHILLICOTHE, BAINBRIDGE & ABERDEEN.—Incorporation has been granted this company in Ohio with a capital stock of $50,000. G. F. Horn, A. A. Luther and others, of Chillicothe, Ohio, are incorporators. The proposed route of the road is not stated.

COLUMBIA & LEBANON.—Incorporation has been granted this company at Frankfort, Ky., with a capital stock of $1,000,000. The road will have a total length of 46 miles, but the proposed route is not stated.

EGYPTIAN COAL R. R.—This company has been organized at Carbondale, Ill., to build a railroad from the Mississippi river northeast through the counties of Jackson, Williamson, Franklin and Jefferson to Mount Vernon, Ill., about 50 miles, where connection will be made with the Louisville & Nashville, the Wabash, Chester & Western, and Chicago & Eastern Illinois. C. E. Hamilton, R. E. Refrow, J. B. Bundy, E. S. Patten and others are incorporators.

ELMGROVE, EASTERN & MAJORSVILLE.—This company has been organized in West Virginia to build a railroad from Elmgrove southeast to Majorsville, 10 miles. G. W. Hand, Elmgrove, W. Va., may be addressed.

GUTHRIE, FAIRVIEW & WESTERN.—Articles of incorporation have been filed by this company in Oklahoma with a capital stock of $13,500,000. The company proposes to build a railroad from Guthrie northwest through Kingfisher to Fairview, 70 miles. Connection will eventually be made with the Kansas City, Mexico & Orient at the latter point. The names of the promoters are not stated.

KANSAS CITY, BURLINGAME & WESTERN.—This will be the name of a company to be organized in Kansas to build a railroad from Olathe west through Gardner, Baldwin, Overbrook and Burlingame to Council Grove, 90 miles. Articles of incorporation will shortly be filed.

KANSAS CITY, OLATHE, LAWRENCE & TOPEKA (ELECTRIC).—This company has been incorporated to build an electric railroad from Topeka east to Kansas City, 55 miles. Alexander Monroe and J. M. Roberts, Lawrence, Kan., and E. Baldwin, Lakeview, Kan., are incorporators.

MOBILE, VOLANTA & PENSACOLA.—Articles of incorporation have been filed by this company in Alabama to build a railroad from Marlow, Baldwin county, Ala., southeast to Pensacola, Fla., 40 miles. Charles Barclay, Marlow, Ala., may be addressed.

NEW ORLEANS TERMINAL.—Plans have been approved by the officials of the Rock Island Company and the Southern Railway for the proposed joint terminal in New Orleans. It is stated that the work will involve an expenditure of about $8,000,000 and that it will take two years to complete the improvement. J. F. Hinckley, St. Louis, Mo., is Chief Engineer.

OREGON & EUREKA.—This road, which was formerly the Eureka & Klamath River, is building an extension from Camp 13 to Big Lagoon, Cal., 18 miles. Grading is practically completed and track laying is under way. Surveys have been made for another branch between Redwood Creek and Camp 13, a distance of 30 miles. A. B. Hammond, Eureka, Cal., is President, and C. W. Root is Chief Engineer.

OREGON & SOUTHEASTERN.—The newspapers say that work will be resumed at once on an extension of this line from Wildwood, Ore., to Osseco. The road runs at present between Cottage Grove and Wildwood, 17 miles, and grading has been completed for a distance of three miles beyond the latter place. J. H. Pearsons, Cottage Grove, Ore., is General Manager.

PAWNEE R. R.—This road, which runs from Auburn to Pawnee, Ill., nine miles, has been sold to the Peabody Coal Company, of Chicago. The entire line will be reballasted and relaid with 75 lb. rails.

PERE MARQUETTE.—It has been announced that this company is about to begin work on a cut-off from Paw Paw, Mich., northwest to Covert, 20 miles. Connection will be made at the latter point with the South Haven Division. When this cut-off is finished there will be a new route between Chicago and South Haven, 15 miles shorter than the route via Hartford.

ST. LOUIS, BROWNSVILLE & MEXICO.—A contract has been awarded to Willard Johnson for building the first 17 miles of the Hidalgo branch of this road, and Johnson & Reed have the contract for the second section of 43 miles. The branch line will be built from a point near Brownsville to Hidalgo, Tex., and will be 60 miles ling.

ST. LOUIS, LITTLE ROCK & GULF.—A contract has been awarded by this company to the Arizona Improvement and Investment Company, for grading the line from Little Rock, Ark., to Winnfield, La. Work will be begun about June 1. W. E. Thomas and A. L. Hale, of Little Rock, Ark., are interested. (March 25, p. 248.)

SOUTH MCALESTER, RED RIVER & GULF.—Articles of incorporation have been filed by this company in Oklahoma. It is proposed to build a line from South McAlester in a southerly direction to the Red River, 80 miles, where connection will be made with the St. Louis & San Francisco. F. H. Kellogg, South McAlester, Okla., is interested.

TEMISKAMING R. R.—Preliminary surveys are reported in progress for the proposed extension of this road from New Liskeard to Lake Abittibi, and it is stated that contracts for grading will be let within a few months, or as soon as the location surveys are completed. W. B. Russell is Chief Engineer.

TENNESSEE R. R.—An application for a charter has been filed by this company in Tennessee. It is proposed to build a railroad from Oneida, on the C. N. O. & T. P., to the mouth of Paint Rock Creek, 12 miles. S. S. Barnes, H. R. Robinson, H. Clay James, Huntsville, Tenn., and J. D. Roberts, Harriman, Tenn., are interested.

WHITE HORSE & ALSEK.—This company has applied to the Dominion Government for a charter to build from White Horse, in the Yukon district, west to Lake Kluane and thence by White Horse Valley to Dawson City. The new line will pass through the gold fields of Alsek and Kaskowlish.

WICHITA FALLS & OKLAHOMA.—Grading has been completed on this road from Wichita Falls, Tex., to Byers, 22½ miles, and track laying is now in progress. It is stated that the line will be open for traffic about June 15. Morgan Jones, Wichita Falls, Tex., is President, and J. W. Field is Chief Engineer. (See Construction Supplement.)

GENERAL RAILROAD NEWS.

ATLANTIC COAST LINE.—Announcement has been made by J. P. Morgan & Co., managers of the Atlantic Coast Line syndicate, of a dividend of 1.94 per cent. to the members of the syndicate who underwrote the $35,000,000 4 per cent. collateral trust bonds which were issued by this company in 1902 to acquire control of the Louisville & Nashville from John W. Gates and associates. The syndicate expired on Dec. 31, 1903, but was extended 14 months to May 1, 1905.

ATLANTA, KNOXVILLE & NORTHERN.—The stockholders of this company will meet on June 17, for the purpose of voting upon the consolidation of the properties and franchises of this company with the Louisville & Nashville.

CANADIAN PACIFIC.—Announcement has been made that of the $7,000,000 notes due the Province of Quebec by this company on account of advances for branch-line construction the $3,500,000 payable on March 1, 1904, has been extended to March 1, 1906, the date on which the remainder falls due.

ERIE.—Official notice has been sent to the holders of the Erie voting trust certificates that, inasmuch as a sufficient number of the holders of the voting trust certificates had not signified their desire to extend the trust it would, therefore, terminate on May 1. In accordance with this announcement, J. P. Morgan & Co. are now receiving the voting trust certificates of the various issues of stock and in return are giving receipts entitling the holders to receive new shares of the Erie stock. The voting trustees have managed the property since it was reorganized in 1895, and recently terminated the voting trust by the declaration of a dividend of 4 per cent. on the first preferred stock. An opportunity was given the stockholders to extend the trust, but, as stated above, this opportunity was not accepted.

EUREKA & KLAMATH RIVER.—This road has been leased to the Oregon & Eureka Railroad Company, and will be operated as a part of it. The officers and directors of the former company will assume their respective duties under the latter company, with headquarters at Eureka, Cal.

LEHIGH COAL & NAVIGATION CO.—The directors of this company have declared a semi-annual dividend of 3½ per cent. This is ½ per cent. in excess of the last dividend and places the annual dividend on a basis of 7 per cent. instead of 6 per cent., as formerly.

LONG ISLAND.—This company has officially announced the purposes for which the money, which it has raised by the sale of its $10,000,000 4 per cent. refunding mortgage bonds, will be used. The improvements planned are as follows: For the rebuilding of the Bay Ridge Division, in Brooklyn, the grade of which must be raised or depressed to do away with grade crossings; for the reconstruction of the tracks and railroads on Atlantic avenue, Brooklyn, and for new freight and passenger stations, new roadways and equipment for steam and electric service. The city of New York will bear some of the expense of eliminating grade crossings in Brooklyn.

LOUISVILLE & NASHVILLE.—See Atlanta, Knoxville & Northern above.

MASON CITY & FORT DODGE.—This company has filed amended articles of incorporation with the Secretary of the State of Iowa increasing its capital stock from $5,000,000 to $20,000,000.

MEXICAN CENTRAL.—It has just been announced that this company last fall borrowed about $4,000,000 from Ladenberg, Thalmann & Co. It is stated that this loan, which falls due in about a month, will be renewed for another six months at 5¼ per cent.

NEW BRUNSWICK ROADS.—The New Brunswick Legislature, at its recent session, granted incorporation to the following railroad companies: Herring Cove R. R., to build from Herring Cove through Albert County; New Brunswick Central, to build from Campbellton to Chipman; and the Tobique & Campbellton, to build from Plaster Rock to a junction with the International at Campbellton.

NEW YORK, ONTARIO & WESTERN.—A communication has been sent to President Fowler of this road, signed by holders of 186,000 shares of the common stock of the company, or about 1-3 of the outstanding stock, protesting against the continuance of the voting trust. This voting trust was to continue until either all the $2,000,000 preferred stock had been retired or until a dividend had been declared on the common stock. As there is now only $4,000 of the preferred stock outstanding, of which $1,200 is said to be owned by the New York Central, these stockholders are anxious to have the voting trust terminated. President Fowler has said that he will call a meeting of the directors in the near future to consider the letter from the stockholders and to take action upon the terminating of the voting trust.

NORTHERN PACIFIC.—On May 1, this company paid a quarterly dividend of 1½ per cent. and ¼ per cent. extra on its common stock. The February dividend was 1½ per cent. with nothing extra. During the calendar year 1903, the regular dividend of 1½ per cent. was paid quarterly, with an extra dividend of ½ per cent. in both February and November, making a total of 7 per cent. for the year. The dividends are declared payable "to those holders who are legally entitled to receive them." The Northern Securities Company, under the recent decision of the Supreme Court, is not considered as a holder, but the individual shareholders of the Northern Securities Company's stock may collect the dividend declared by the Northern Pacific on exchange of their stock for the shares of the N. P.

NORFOLK & WESTERN.—At a recent meeting of the directors of this company, it was decided to recommend to the stockholders that a new issue of bonds be made and for this purpose a special meeting of the stockholders has been called for June 17 at Roanoke, Va. The proposed bond issue will be $35,000,000. The bonds will run for 40 years and will bear interest at a rate not exceeding 4 per cent. They will be a first lien on the extensions and branches which are now free from the lien of the first consolidated mortgage bonds. One of the officers of the company has said that the directors do not intend to make any sale of the new bonds, as the cash on hand obtained from the sale of its consolidated mortgage bonds and equipment trust certificates is ample for current expenses. The company has acquired many subsidiary lines and the money will be used, in large part, for improvements on these lines.

OREGON & EUREKA.—See Eureka & Klamath River above.

PENNSYLVANIA.—At a meeting of the directors of this company on May 2, the regular semi-annual dividend of 3 per cent. was declared. Gross earnings for the entire system for March show a decrease of $689,600 as compared with March, 1903. Operating expenses increased $619,500, leaving a decrease in net earnings for the month of $1,309,100. For the first quarter of the new year, gross earnings of the entire system decreased $1,965,100, and operating expenses increased $1,607,200, leaving a decrease in net earnings for the three months of $3,572,300.

The Supreme Court of the State of Pennsylvania has handed down a decision stating that the Pennsylvania R. R. Co. is authorized by its charter "to make such lateral railroads or branches leading from the main line to such convenient place or points in either of the counties into or through which the main line may pass, as the president or board of directors may deem advantageous and suited to promote the convenience of the inhabitants thereof and the interests of the said company." This decision dissolves the injunction which was recently granted against the company restraining it from building a line from the main line at Paoli to Thorndale, in Chester County, Pa.

PITTSBURG TERMINAL R. R. & COAL CO.—Notice has been filed with the Secretary of State at Harrisburg, of an increase in the capital stock of this company from $1,000,000 to $14,000,000. This company owns the West Side Belt R. R. and coal properties, against which there are $7,000,000 outstanding bonds. The proceeds from the sale of new stock is to be used to refund these bonds and to pay for improvements.

PUBLIC SERVICE CORPORATION.—This company has leased the Camden & Suburban for 999 years, from May 1, the annual rental being guaranteed. The Camden & Suburban controls 70 miles of track between Camden, Haddonfield, Merchantville, Moorestown, Collingswood and Delair. The company will soon begin to sell through tickets from Jersey City to Trenton, a trackage arrangement having been made over the Trenton & New Brunswick line between Milltown, N. J., and Trenton. At the latter point connection will be made with the steamers of the Delaware Navigation Company running to Philadelphia.

ST. LOUIS & SAN FRANCISCO.—A meeting of the directors of this company will be held at Sherman, Tex., on May 17, to consider the proposition to merge all the Frisco lines in Texas into one company. The lines which this company proposes to consolidate are as follows: The St. Louis, San Francisco & Texas, 141½ miles; Fort Worth & Rio Grande, 196 miles; Red River, Texas & Southern, 89 miles; Paris & Great Northern, 17 miles; Blackwell, Enid & Texas, 13 miles, and the Oklahoma City & Texas, nine miles, representing a total mileage in Texas of 338 miles. It is stated that these lines will be merged into a company called the St. Louis, San Francisco & Texas.

VERA CRUZ & PACIFIC.—This road, which went into the hands of a receiver in November of last year, has been bought by the Mexican Government. It is stated that the price paid will be sufficient to pay the depositors and creditors in full the $5,700,000 which is due with interest. The new arrangement calls for a $7,000,000 bond issue by the railroad, guaranteed by the Mexican Government. Of this amount, $1,000,000 will be used to complete the railroad, $1,000,000 will be reserved for future requirements and $5,000,000 will go to the Maryland Trust Company. This railroad, which runs from Cordoba to Santa Lucretia, 203 miles, with a branch line from Vera Cruz to Tierra Blanca, 62 miles, was placed in the hands of a receiver last fall owing to the failure of the Maryland Trust Company, of Baltimore, which was financing the road. Allen McLane has been the temporary receiver.

WABASH.—It is reported that this company will soon issue $900,000 5 per cent. car trust certificates, $45,000 being redeemable semi-annually for 10 years. Ten per cent. of the cost of the equipment will be paid for in cash and the certificates will be issued for the remainder secured by all the equipment.

WHEELING & LAKE ERIE.—A special meeting of the Board of Directors of this company will be held in Cleveland within the next two weeks to ratify the purchase by this company of the Pittsburg, Lisbon & Western and the Youngstown & Southern railroads.